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# Report on the Quality of Marine Surface Observations

## Report Number 25

January to July 2001

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# REPORT ON THE QUALITY OF MARINE SURFACE OBSERVATIONS:

## JANUARY TO JULY 2001

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## 1. INTRODUCTION

In 1985, the Commission for Basic Systems (CBS) agreed that there was a need for GDPS / Global NWP centres to monitor the quality of observations available on the GTS and to exchange monthly lists of stations providing seemingly erroneous data. In 1988 three lead centres were nominated which would have a co-ordinating role of producing, at six-monthly intervals, consolidated lists of suspect stations for given data types together with information on the nature of the error. The Met Office was allocated the role as lead centre for marine surface observations which encompass observations from ships, drifting buoys, moored buoys and other fixed marine platforms. This is the twenty-fifth of its reports and covers the period January to June 2001. For each observing platform identified as suspect, values are supplied for the number of observations received at the Met Office, the number of these observations with gross errors, the observations' mean differences from the background values used by the numerical data assimilation system and the standard deviations of these differences.

Following the CBS recommendations, by the end of the 1980s there were four centres active in the monthly exchange of monitoring information; The Met Office, ECMWF, RSMC Tokyo and NCEP. Since then, a number of other centres have also begun to exchange this information and these reports have included data provided by Météo-France as of report number 23. Initially, the only monitoring information exchanged on marine surface observations related to pressure, and the first two WMO reports addressed that parameter alone. Since then, these reports have contained monitoring statistics for wind observations, now being exchanged between centres on a consistent monthly basis. In addition, the report contains monitoring results for sea-surface temperature (SST). Due to changes in the observation processing system and database structure, there was no monitoring of SST data at the Met Office from May 1998 to September 2000. The SST information presented in reports 20 to 23 was therefore compiled, with permission, from the monthly NCEP monitoring data and so is not directly comparable with that presented in other reports. SST monitoring was reinstated at the Met Office from October 2000 and is fully available as of this report.

## 2. MONITORING METHODS

Errors in observations may arise from a number of sources: the instrument may be malfunctioning, figures may be mistaken while being transferred manually, or there may be corruption of data during transmission. Errors can also arise in the pressure report if the adjustment to sea level is made incorrectly or not at all, and a poorly sighted anemometer can result in errors in the observations of wind. For SST observations, the depth at which the observation is made can be crucial. 'Surface' observations from buoys are usually made at a depth of around 0.5m, whereas ships may take a measurement between a depth of 10m and the surface, depending on the method used. At present, there is no indication given within the report of the observation's depth, so it is not possible to determine the significance of this factor. (By contrast, satellites measure the temperature of the ocean's 'skin' which is generally slightly cooler than the temperature immediately beneath, by several tenths of a °C, as a result of evaporative cooling and other surface processes.)

Some errors can be detected by applying checks on the code format and the internal consistency of the report (for example: are the position and pressure consistent with a report 6 hours earlier?). Checks on spatial consistency are possible if there are other nearby observations. However, such quality checks are unable to identify errors on all occasions and it is recognised that the numerical data assimilation systems in use today can provide global reference values applicable in observation monitoring. The short-term forecast from the previous numerical analysis, commonly known as the first-guess or background field, provides perhaps the most useful information on observation quality, as it represents an accurate and spatially consistent estimate of the observed value which is independent of the observation itself. Observation-minus-background (hereafter referred to as O-B) differences are at the core of all monitoring work by GDPS centres. Unlike wind and pressure, SST monitoring at the Met Office used to be performed against the analysis field, this being judged a sufficiently good approximation due to the slowly varying nature of SST, relative to parameters measured above the surface. As of October 2000, background values have been used but with the slowly varying nature of SST used to assume persistence, such that the background is in fact the previous analysis. (These analyses are performed daily at the Met Office from an assimilation of both surface and satellite observations.) Thus the SST monitoring at the Met Office is no longer limited by a dependence upon the observations themselves.

Taking all marine surface observations together, the values of O-B have distinct characteristics. The vast majority of the observations show quite small departures from background and the distribution of O-B is nearly Gaussian, with little or no bias. The errors in the background field probably contribute most to the values of O-B for these observations. There is often, however, a smaller group of observations departing much more from the background, for which observation error is the only reasonable explanation for the large values of O-B. Studies of the distribution and variation of O-B at different points around the globe enable reasonably accurate estimation of background error, and this provides the basis for the monitoring methods described here. Those marine observing platforms for which, in a sufficiently large sample, the observed values differ from the background by an amount significantly in excess of the estimate of background error, may be labelled as suspect with a high degree of confidence. The limits used here to identify suspect observing platforms have been set sufficiently stringent to preclude much likelihood of the background, rather than the observations, being in error.

Each monitoring centre produces a monthly list of the identifiers of marine observing platforms considered suspect according to the departure from the model background values. All observations, both synoptic and asynoptic, are assimilated. At the Met Office (as of May 2000) and ECMWF, the background fields are interpolated to the observation time whereas Météo-France, Tokyo and Washington, use the background value valid at the nearest main synoptic hour.

Given that the number of observations made during the month is at least 20, then the condition used by all centres for obtaining platforms for the suspect lists is that at least one of the following criteria are satisfied:

**Pressure**

1. the | mean of O-B | ≥4.0 hPa
2. the standard deviation of O-B ≥6.0 hPa
3. the percentage of gross errors ≥25

**Wind**

1. the | mean of O-B | ≥5.0ms$^{-1}$ (Speed)
   ≥30° (Direction)
2. the standard deviation of O-B ≥80° (Direction)
3. the percentage of gross errors ≥25

Gross errors are defined as observations that depart from the background by more than 15hPa (Pressure) or 25ms$^{-1}$ (Vector Wind). The mean and standard deviation of the samples are evaluated excluding gross errors and in this way occasional 'wild' values resulting from, for example, corruption during transmission, do not influence the sample characteristics. Direction statistics are also calculated excluding values in light winds, where either the observed or background speeds are less than 5ms$^{-1}$.

Relatively little information is exchanged between centres on a regular monthly basis for SST.

The monthly results for pressure from all five monitoring centres show considerable agreement, both on the observing platforms listed as suspect and the values of the mean and rms difference from each centre's background. Differences between the monthly suspect lists are usually due to the different numbers of observations available at each centre. The cut-off varies between 6 and 24 hours. There are also some unexplained variations in the data receipt between the centres, which may be due to problems in the GTS or in the local procedures for handling the data. Monitoring results for wind speed also show reasonable agreement on the mean and standard deviation from each centre's background; there is less agreement as to which platforms are listed, reflecting the greater uncertainty when monitoring wind speed.

This report draws together all the monthly monitoring results exchanged on marine surface data and identifies a list of observing platforms that have provided observations of poor quality over the 6-month period. In drawing up this list, there have been a number of guiding principles:

1. As with the monthly lists, accuracy is assessed relative to background values.
2. Observing platforms are listed only where there is a very high degree of confidence that the observations rather than the background values are in error.
3. At least 40 reports are required over the period in which the observations are considered suspect.
4. The perceived accuracy over the last part of the six-month period is of greatest importance; observing platforms are not listed if there has been recent improvement and their reports are at present without major error.
5. Given that the number of observations made during the period is greater than or equal to 40, then the condition for listing a platform as suspect in this report is that at least one of the following criteria are satisfied:

**Pressure**

1. the | mean of O-B | ≥3.5 hPa
2. the standard deviation of O-B ≥5.0 hPa
3. the percentage of gross errors ≥25

**Wind**

1. the | mean of O-B | ≥5.0ms$^{-1}$ (Speed)
≥30° (Direction)
2. the standard deviation of O-B ≥6.0ms$^{-1}$ (Speed)
≥60° (Direction)
3. the percentage of gross errors ≥25

**SST**

1. the | mean of O-B | ≥3.0 °C
2. the standard deviation of O-B ≥5.0 °C
3. the percentage of gross errors ≥25

All observations having gross errors are excluded from the calculation of the mean and standard deviation of O-B. The same gross error limits apply in these reports as in the monthly lists. The Met Office now sets a limit of 10°C for SST but this was previously 5°C and NCEP use 15°C. Also, criteria previously used in these reports were based on O-A statistics. Data presented here is, then, not directly comparable with that in previous reports.

The limits on the bias and standard deviation O-B are less stringent than those for the monthly lists because the sample sizes are larger. If there has been a recent change in quality, they are only applied at the end of the period. Identifiers can be listed in this report without appearing on any of the monthly lists. This can be due to a representative sample only being obtained over several months or deterioration occurring at the end of the period for platforms reporting very frequently. The 6-month list is longer than most of the monthly lists because many ships cease reporting for variable periods of time, in many cases while they are in port or out of service. Only over a relatively long period, probably more than 6 months, is a representative sample obtained from all those ships providing observations.

## 3. MONITORING RESULTS

The monitoring results presented in this report relate only to data exchanged over the GTS. Observations from marine platforms are transmitted in one of two formats: the SHIP code, used for most observations from ships, moored buoys and other fixed platforms, and the BUOY code, used mostly for observations from drifting buoys. In this report, the term "ship observations" refers to those received in the SHIP code and the "drifting buoy observations" to those received in BUOY code. The SHIP code indicates whether the observation was made manually or by an automatic system and accordingly the sub-divisions "manual ship" and "automatic ship" will be defined.

### *3.1 Pressure*

In the six-month period, January to June 2001, 1708918 observations of pressure were monitored at Bracknell from 6595 manual ships, 554 drifting buoys, and 605 automatic ships. The number of reports received from individual ships varies greatly as Table 1 demonstrates; apparently, a large percentage only report once. The reason for this is unclear but it may be a result of errors in the part of the message giving the ship identifier. A comparison with the corresponding table in report number 24 shows a decrease in the number of observations but, when compared with the equivalent 6-month period over several years, shows a continuing gradual increase. Since most marine observations are located in the northern hemisphere, there is inevitably some seasonal variation in the number of vessels reporting, especially in the case of buoys, since new or replacement buoys are generally deployed in better weather conditions.

Table 2 shows the number of observations of pressure that have been received over the GTS at the Met Office and processed, over past 6-month periods. Due to changes in data storage methods in May 1991, report number 5 covered the period January to May 1991 only, thence figures for January to June 1991 have been scaled-up in order to make a fair comparison with other 6-month periods; this may not be entirely accurate. Further changes in November 1993 for drifting buoys and automatic ships for pressure and winds, may have allowed duplication of a few identifiers in totals for the period June to December 1993, as reclassification from one observation type to another occurred. The observation distribution shown in Table 2 will also have been affected in the long term with a slight shift towards drifting buoys; no duplication of observations occurred however. (SST observations were not affected by the November 1993 change.) The period January to June 1998 is also based on only 5 months data (February-June), but the numbers of observations received have been scaled up, as in the 1991 case.

Figure 1 shows the information presented in Table 2 more clearly. It can be seen that the total number of observations remained fairly steady with only minor fluctuations until report number 11 (January-June 1994). Since that time however, there has been a steady increase in the total, with the number of observations of pressure nearly doubling between reports 11 and 16 (July-December 1996), a period of just 2.5 years. This increase was due to the larger number of reports from each drifting buoy, as reliability has improved; many drifting buoys now make several thousand observations of pressure during a 6-month period. The number of reports from drifting buoys now exceeds those for manual ships by around 70%, with a little under 50% of all marine pressure observations now being made by drifting buoys. The sudden increase seen in the number of automatic ships in report number 19 (January-June 1998) was due to observation processing changes at the Met Office, whereby all reports from 'automatic ships' are processed, rather than only one report per 6-hour assimilation period, as previously. Since then there has been a steady increasing trend in the total number of pressure reports.

A histogram of O-B differences for all ship pressure reports in the period January to June 2001 is shown in Figure 2a, together with the Gaussian distribution with the same mean and standard deviation. Although almost all values fall within the range +5 to -5 hPa, a small number of much larger values, presumably resulting from erroneous observations, contribute to the large standard deviation of the population. The distribution for all those observations which fail the automatic quality-control checks is broad (Figure 2b). The remaining 95% of the observations, that pass the quality checks, show a distribution of O-B which is very close to Gaussian (Figure 2c) with mean –0.2 hPa and standard deviation 1.4 hPa. The principal contribution to the standard deviation is assumed to be from background errors.

A global estimate of the background error, such as that provided above, can conceal large spatial variations. Background values will be more accurate in data-rich areas (e.g.: in the North Sea or Mediterranean) or where the meteorological variability is low (e.g.: the tropics). The geographical distributions of the mean and standard deviation of the values of O-B from all ship observations which pass the quality-control checks, have been calculated for 10-degree latitude-longitude boxes and are plotted in Figures 3 and 4. In most areas, the magnitude of the mean is less than 1.0 hPa, the exceptions being generally where the sample size is small. The standard deviation is generally around 1.5 hPa. The number of ship pressure reports accepted by the model quality control in each 10-degree box is shown in Figure 5.

Table 3 contains a list of those ships and drifting buoys considered to have produced suspect observations of pressure in the period January to June 2001. Values over the six-month period are given for the number of observations of pressure available for Met Office global model runs, the number of observations differing from the model background value by more than 15 hPa (gross errors), and the mean and standard deviation of the model O-B. The number of times the identifier has appeared on the monthly suspect lists from the five monitoring centres is also given. In order to give a detailed picture of the frequency of reporting and any changes in the observation accuracy, 6-month time-series of O-B differences are given at the end of the report for each of the identifiers listed.

An interesting characteristic of the errors identified here, which soon becomes obvious on inspection of the time-series charts at the end of this report, is that most can be attributed to a bias in the observed pressure. In many cases, the bias is constant over the whole monitoring period; although some values depart greatly from the sample mean, presumably due to some gross error in the observation, these are generally isolated instances. In only a few cases are there regular large random departures from background. Those observing platforms listed in Table 3 which appeared in report number 24 (July to December 2000) have been indicated with an asterisk. A comparison of the statistics given here with those in the report number 23 (January to June 2000), clearly indicates that the bias in the pressure observations from a few ships has hardly changed for more than a year.

Statistics for those marine observing platforms listed in report number 24 and which do not appear in Table 3b, are given in Table 4 along with comments on the quality of their pressure observations. Time-series charts of the pressure observations from these platforms are not given. Less than 40 reports were received in the 6-month period for many of the ships on this list. Approximately 40 % of them, however, do show some improvement in the quality of their observations.

### *3.2 Wind*

Monitoring observations of wind is more problematical than pressure. On most observing platforms, wind is measured using anemometers; the reported speed depends upon the averaging period and instrument height above sea level, which varies a great deal between platforms. Since large structures distort wind flow, the anemometer position relative to the wind bearing and platform structure does affect the measurement. (These factors do not apply to those ship observations where wind speed is based on visual estimates of the sea state.)

In these monitoring results, the background winds are valid at a height of 10 metres above mean sea level; slightly lower than the average height of ship anemometers. Where anemometer height is much different from 10 metres, a significant O-B speed bias may be evident. Examples of this are, observations from oil rigs or tankers with anemometer heights of 50m or more and buoys, where the anemometer can be as low as 2m.

In the period January to June 2001, 1011258 wind observations were available for monitoring at Bracknell, from 6986 manual ships, 301 drifting buoys, and 718 automatic ships. (More detail is given in Table 1.) The number of reported manual ship identifiers has decreased but, as for pressure, the number of observations is gradually increasing when comparing the same period in previous years. As stated for pressure observations, the large increase in the number of monitored wind observations, seen in report number nineteen, was largely due to the inclusion of all 'automatic ship' data, not just one report in each six hour period.

Histograms of O-B differences for ship observations of wind speed are presented in Figures 2d, 2e and 2f and of wind direction in Figures 2g, 2h and 2i. As with observations of pressure, those wind observations that fail the quality-control checks differ most from background, some by as much as 50 $ms^{-1}$, and they make a large contribution to the variance of O-B. The distributions of O-B wind speed and direction for the remaining 92% of the observations are nearly Gaussian. There is a speed bias of 1.2 $ms^{-1}$ relative to background, with a direction bias of just –1.9°.

Figures 6 and 7 show the geographical distributions over the six-month period of the mean and standard deviation of O-B for ship observations of wind speed that pass the quality-control checks. The numbers of wind reports used to generate these statistics are presented in Figure 8. The standard deviation of O-B wind speed is typically 2.5 to 4 $ms^{-1}$ in middle latitudes and 2 to 3 $ms^{-1}$ in the tropics. The bias is generally around +1 $ms^{-1}$, but exceeds +2 $ms^{-1}$ in a few places. Similar distributions of the mean and standard deviation of O-B wind direction are shown in Figures 9 and 10. Only reports where both the observed and background wind speeds are greater than 5$ms^{-1}$ were used to obtain these values. The magnitude of the bias is less than 10 degrees in most places. The standard deviation is generally between 20 and 30 degrees globally but in some data-sparse areas, it is as large as 40 or 50 degrees. The numbers of reports of wind direction used to generate these statistics are presented in Figure 11.

Figures 6-11 provide reference values against which to compare the O-B characteristics for different marine observing platforms. Table 5 contains a list of those ships and drifting buoys considered to have produced suspect observations of wind speed in the period January to June 2001, and in Table 7 a similar list is provided for wind direction. Values are given for the number of observations of wind received at the Met Office, the number of observations having a vector difference from background of more than 25$ms^{-1}$ (gross errors), and the mean and standard deviation of O-B. Time-series of O-B are given at the end of the report for each listed identifier. In the majority of the cases of suspect speed observations, a constant bias is clearly evident. Errors in observations of direction are more random in nature. Tables 6 and 8 contain statistics for platforms reporting in ship code which are not included in Tables 5 and 7 but that were listed in the previous report, for wind speed and direction respectively. Time-series plots for these identifiers are not included in this report.

### *3.3 Sea-surface temperature*

In the six-month period January to June 2001, a total of 1,952,007 observations of SST were monitored at the Met Office, from 5,269 manual ships, 1, 066 drifting buoys and 532 automatic ships. Of the total, 392,125 were from manual ships, 1,145,832 from drifting buoys and 414,050 from automatic ships. (More detail is given in Table 1.) For the same reasons as stated for pressure observations, it appears that many identifiers report only once during the six-month period. Despite there being a relatively small number of drifting buoys, they contribute a substantial percentage of the total number of SST observations received. This is due to the frequency of buoy observations; hourly in many cases, with ships tending to report only at the main synoptic hours.

Histograms of O-B differences for all ship SST reports are shown in Figures 2j, 2k and 2l. As with observations of pressure and wind, those SST observations that fail the quality-control checks differ most from background and make a large contribution to the variance of O-B. The distribution of O-B SST for the remaining 91% of the observations is nearly Gaussian. There is a bias of 0.1°C relative to background.

Figures 12 and 13 show the geographical distributions over the three-month period of the mean and standard deviation of O-B for ship observations that pass the quality control checks. The numbers of reports used to generate these statistics are presented in Figure 14. The bias is generally around 0.5°C and the standard deviation 1 to 2°C. Particular exceptions to this tend to show up where the number of observations is relatively low.

Table 9 contains a list of the ships and drifting buoys considered to have produced suspect observations over the 6-month period. The comments given in each case provide an indication of the main reason for the station to be listed as suspect; time-series charts have also been plotted for SST and are included at the end of the report. The majority of the identifiers appearing on the list do so because of bias. Table 10 gives details of the performance over the latest 6-month period of ships which were considered suspect in the previous period but which do not appear in Table 9.

## 4. SUMMARY

118 marine observing platforms are listed as producing suspect observations of pressure over the period January to June 2001, 106 as producing suspect wind observations and 123 as producing suspect SST observations. The first report issued by RSMC Bracknell, for the period January to June 1989, listed 150 marine platforms producing suspect observations of pressure. With the selection criteria remaining unchanged, an initial reduction in the number of platforms listed as suspect was followed by a series of reports listing similar numbers of suspects. This report shows slightly fewer suspect pressure observations and an increase in suspect wind and SST observations compared to the previous report (124, 80 and 79 respectively). The large increase in the number of suspect SST observations is due to the previous report only covering three months for this particular parameter. The increase in suspect winds, when taken with the decrease in number of observations, appears to indicate wind observations of slightly lower quality. Overall, when considered alongside the fluctuations in numbers of platforms reporting and observations monitored, there does not appear to be a significant change in observation quality.

The most common characteristic in the case of identifiers listed as producing suspect pressure observations is bias in the reported pressure, sometimes remaining constant for many months. In the case of wind suspects, the most common reason for listing a platform is a bias in the reported wind speed, while a few show large standard deviations or biases in wind direction. For sea-surface temperature observations, bias is again the most common cause of error.

The selection criteria have been set sufficiently stringent to ensure that the platforms listed are only those for which there is a high degree of confidence in their reports having errors. There are many others, not listed here, for which there must be considerable doubt over the quality of the observations. A wider range of monitoring results is available from the Met Office on request.

## TABLE 1: FREQUENCY DISTRIBUTION OF THE NUMBER OF REPORTS OF PRESSURE, WIND AND SEA SURFACE TEMPERATURE FROM INDIVIDUAL IDENTIFIERS AVAILABLE FOR MONITORING AT BRACKNELL, JANUARY TO JUNE 2001.

| Number of reports | Number of manual ships reporting | | | Number of drifting buoys reporting | | | Number of automatic ships reporting | | |
|---|---|---|---|---|---|---|---|---|---|
| | Press. | Wind | SST* | Press. | Wind | SST* | Press. | Wind | SST* |
| 1 | 3261 | 3467 | 2434 | 140 | 189 | 140 | 255 | 302 | 197 |
| 2-10 | 923 | 930 | 692 | 47 | 35 | 54 | 132 | 135 | 99 |
| 11-20 | 255 | 253 | 215 | 6 | 5 | 11 | 5 | 6 | 8 |
| 21-40 | 278 | 310 | 268 | 12 | 4 | 10 | 7 | 6 | 3 |
| 41-100 | 627 | 701 | 589 | 13 | 6 | 29 | 13 | 18 | 10 |
| 101-200 | 603 | 655 | 522 | 8 | 4 | 38 | 18 | 17 | 11 |
| 201-500 | 554 | 580 | 468 | 42 | 13 | 146 | 17 | 51 | 35 |
| 501-1000 | 52 | 53 | 41 | 54 | 12 | 204 | 26 | 53 | 56 |
| 1001-1500 | 12 | 13 | 11 | 52 | 18 | 161 | 38 | 36 | 31 |
| 1500+ | 30 | 24 | 29 | 180 | 15 | 273 | 94 | 94 | 82 |
| **Total** | 6595 | 6986 | 5269 | 554 | 301 | 1066 | 605 | 718 | 532 |
| (Report 24) | (7318) | (7831) | (3986) | (543) | (234) | (869) | (598) | (687) | (411) |

* numbers are for automatic (fixed) buoys only

TABLE 2: NUMBER OF OBSERVATIONS OF PRESSURE RECEIVED AT BRACKNELL ON THE GTS FOR EACH OF THE SIX-MONTH PERIODS COVERED BY THE WMO REPORTS ON THE QUALITY OF MARINE OBSERVATIONS.

| Period | WMO report number | Number of Observations | | | |
|---|---|---|---|---|---|
| | | Manual ships | Drifting buoys | Automatic ships | Total |
| Jan - Jun 1989 | 1 | 424087 | 174971 | 40082 | 639140 |
| Jul - Dec 1989 | 2 | 421315 | 151972 | 58016 | 631303 |
| Jan - Jun 1990 | 3 | 424335 | 177927 | 63847 | 666109 |
| Jul - Dec 1990 | 4 | 412430 | 205488 | 71146 | 689064 |
| Jan - Jun 1991 | 5 | 364760 | 177069 | 64401 | 606230 |
| Jul - Dec 1991 | 6 | 348710 | 148604 | 68456 | 565770 |
| Jan - Jun 1992 | 7 | 332443 | 216872 | 73893 | 623208 |
| Jul - Dec 1992 | 8 | 336958 | 247873 | 80862 | 665693 |
| Jan - Jun 1993 | 9 | 340293 | 288208 | 77317 | 705818 |
| Jul - Dec 1993 | 10 | 348082 | 316261 | 88650 | 752993 |
| Jan - Jun 1994 | 11 | 334134 | 279963 | 111928 | 726025 |
| Jul - Dec 1994 | 12 | 383760 | 305618 | 142468 | 831846 |
| Jan - Jun 1995 | 13 | 369781 | 407111 | 124537 | 901429 |
| Jul - Dec 1995 | 14 | 394016 | 528938 | 138653 | 1061607 |
| Jan - Jun 1996 | 15 | 430162 | 566035 | 122909 | 1119106 |
| Jul - Dec 1996 | 16 | 477928 | 621869 | 133221 | 1233018 |
| Jan - Jun 1997 | 17 | 446530 | 623835 | 122178 | 1192543 |
| Jul - Dec 1997 | 18 | 453399 | 684292 | 140227 | 1277918 |
| Jan - Jun 1998 | 19 | 426622 | 700743 | 423217 | 1550582 |
| Jul - Dec 1998 | 20 | 443548 | 700239 | 497313 | 1641100 |
| Jan - Jun 1999 | 21 | 432506 | 697983 | 466311 | 1596800 |
| Jul - Dec 1999 | 22 | 448996 | 771624 | 500070 | 1720690 |
| Jan - Jun 2000 | 23 | 443023 | 772510 | 455799 | 1671332 |
| Jul - Dec 2000 | 24 | 477828 | 829588 | 512338 | 1819754 |
| Jan - Jun 2001 | 25 | 458345 | 784686 | 465887 | 1708918 |

## TABLE 3: LIST OF MARINE OBSERVING PLATFORMS REPORTING SUSPECT PRESSURE OBSERVATIONS OVER THE PERIOD JANUARY TO JUNE 2001.

| | | |
|---|---|---|
| Column | 1 | Call sign or identifier. |
| Column | 2 | Number of pressure observations available for monitoring over the 6-month period, excluding duplicates, but including any observations with gross errors. |
| Column | 3 | Number of pressure observations differing by more than 15 hPa from background (gross error). |
| Column | 4 | Standard deviation of observation-minus-background differences excluding cases of gross error. |
| Column | 5 | Mean of observation-minus-background differences (bias) excluding cases of gross error. |
| Columns | 6-10 | Number of times observing platform has appeared on suspect lists. B=Bracknell, E=ECMWF, F=MétéoFrance, T=Tokyo, W=Washington. |
| Column | 11 | Comments on quality of pressure observations. |

*Notes*:
1. Units are hPa.
2. Observing platforms marked with an asterisk were listed in the previous report July to December 2000)

### Table 3a: Platforms reporting in BUOY code

*i): Platforms **non-operational** at the end of the reporting period*

| Identifier | N Obs. | NGE | SD | Bias | B | E | F | T | W | Comments |
|---|---|---|---|---|---|---|---|---|---|---|
| 17546 | 293 | 0 | 0.7 | -5.7 | 1 | 1 | 1 | 1 | 1 | Bias |
| 17601 | 91 | 72 | 8.5 | 3.2 | 1 | 1 | 1 | 0 | 1 | Gross Errors |
| 17639 | 2591 | 55 | 2.3 | 1.3 | 0 | 0 | 0 | 0 | 0 | Bias |
| 17641 | 1220 | 10 | 3.2 | 2.2 | 0 | 0 | 0 | 0 | 1 | Bias |
| 17645 | 345 | 127 | 4.6 | 1.6 | 1 | 1 | 1 | 0 | 1 | Gross Errors |
| 17646 | 4122 | 130 | 2.1 | -1.2 | 0 | 0 | 0 | 0 | 0 | Gross Errors |
| 21604 | 65 | 65 | --- | --- | 1 | 1 | 1 | 0 | 1 | Gross Errors |
| 23933 | 232 | 124 | 3.6 | -7.1 | 1 | 1 | 1 | 1 | 1 | Gross Errors |
| 31526 | 56 | 56 | --- | --- | 1 | 1 | 1 | 0 | 1 | Gross errors |
| 31535 | 2023 | 482 | 3.8 | 0.6 | 1 | 1 | 1 | 1 | 1 | Gross Errors |
| 31537 | 217 | 0 | 1.7 | -3.8 | 0 | 0 | 0 | 0 | 0 | Bias |
| 31953 | 2174 | 14 | 2.6 | 7.9 | 4 | 4 | 4 | 3 | 4 | Bias |
| 31980 | 599 | 16 | 2.1 | 1.8 | 0 | 0 | 1 | 0 | 0 | Gross Errors |
| 33569 | 382 | 5 | 2.5 | 1.7 | 1 | 1 | 0 | 0 | 0 | Bias |
| 33570 | 375 | 2 | 3.0 | 3.6 | 1 | 1 | 1 | 0 | 1 | Bias |

Continued →

| Identifier | N Obs. | NGE | SD | Bias | B | E | F | T | W | Comments |
|---|---|---|---|---|---|---|---|---|---|---|
| 33571 | 729 | 58 | 2.9 | -0.9 | 0 | 0 | 0 | 0 | 0 | Gross Errors |
| 33622 | 262 | 53 | 4.7 | -2.0 | 1 | 1 | 1 | 1 | 1 | Bias and Gross Errors |
| 33953 | 449 | 61 | 5.8 | 2.4 | 2 | 2 | 1 | 0 | 0 | Bias |
| 44723 | 762 | 68 | 2.5 | -0.9 | 1 | 1 | 1 | 0 | 1 | Gross Errors |
| 44724 | 2828 | 182 | 0.8 | 0.3 | 1 | 1 | 1 | 1 | 1 | Gross Errors |
| 46585 | 251 | 53 | 6.9 | -3.9 | 1 | 1 | 1 | 1 | 1 | Gross Errors |
| 46624 | 109 | 64 | 3.2 | -9.8 | 1 | 1 | 1 | 0 | 1 | Gross Errors |
| 48581 | 2207 | 0 | 1.6 | 0.0 | 0 | 0 | 0 | 0 | 0 | Bias |
| 52643 | 40 | 32 | 7.4 | -2.8 | 1 | 1 | 1 | 0 | 1 | Gross Errors |
| 55904 | 2906 | 40 | 1.1 | -0.8 | 0 | 0 | 0 | 0 | 0 | Gross Errors |
| 61538 | 336 | 240 | 0.8 | -0.4 | 1 | 1 | 0 | 0 | 1 | Gross Errors |
| 64699 | 62 | 14 | 5.4 | 5.9 | 1 | 1 | 1 | 0 | 1 | Bias and SD |
| 65601 | 909 | 149 | 3.1 | 0.0 | 0 | 0 | 0 | 0 | 0 | Gross Errors |
| 71512 | 440 | 178 | 2.1 | -0.2 | 1 | 1 | 1 | 0 | 1 | Gross Errors |

*ii): Platforms **operational** at the end of the reporting period*

| Identifier | N Obs. | NGE | SD | Bias | B | E | F | T | W | Comments |
|---|---|---|---|---|---|---|---|---|---|---|
| 17647 | 3670 | 66 | 1.9 | -0.4 | 0 | 0 | 0 | 0 | 0 | Bias |
| 25540 | 1439 | 171 | 1.0 | -0.6 | 0 | 0 | 0 | 1 | 0 | Gross Errors |
| 41504 | 1064 | 106 | 1.5 | 0.3 | 1 | 1 | 1 | 1 | 1 | Gross Errors |
| 46561 | 1282 | 0 | 1.1 | -4.0 | 3 | 2 | 0 | 1 | 4 | Bias |
| 56808 | 71 | 71 | --- | --- | 1 | 1 | 1 | 0 | 1 | Gross Errors |

## Table 3b: Platforms reporting in SHIP code

| Identifier | N Obs. | NGE | SD | Bias | B | E | F | T | W | Comments |
|---|---|---|---|---|---|---|---|---|---|---|
| ATZS | 44 | 0 | 2.0 | 5.0 | 1 | 1 | 1 | 0 | 1 | Bias |
| AVOSTEST | 55 | 15 | 4.5 | -5.9 | 1 | 0 | 1 | 1 | 0 | GE and Bias |
| CGDS | 508 | 370 | 4.1 | -8.3 | 5 | 5 | 5 | 2 | 5 | GE |
| CYLX * | 51 | 21 | 2.2 | -13.1 | 0 | 0 | 0 | 0 | 0 | Gross Errors |
| C6FD9 * | 100 | 0 | 2.0 | 3.5 | 1 | 1 | 1 | 0 | 1 | Bias |
| C6FE5 * | 107 | 1 | 4.3 | 9.5 | 2 | 2 | 2 | 1 | 2 | Bias |
| C6FE6 * | 75 | 0 | 1.5 | 4.1 | 1 | 2 | 2 | 0 | 2 | Bias |
| C6FP2 | 99 | 0 | 2.6 | 7.0 | 2 | 2 | 2 | 1 | 2 | Bias |
| C6LU3 | 52 | 0 | 2.2 | 3.5 | 0 | 0 | 3 | 2 | 3 | Bias |
| C6PZ3 | 181 | 0 | 1.7 | 6.7 | 4 | 5 | 5 | 2 | 5 | Bias |
| C6QK * | 90 | 0 | 1.5 | 5.7 | 1 | 1 | 3 | 1 | 3 | Bias |
| DGSR * | 185 | 0 | 1.7 | -4.5 | 4 | 3 | 2 | 1 | 3 | Bias |
| DPBP | 142 | 34 | 6.2 | -5.0 | 2 | 0 | 2 | 0 | 2 | Bias and SD |
| ELAQ5 | 41 | 0 | 1.0 | 4.9 | 1 | 1 | 1 | 0 | 1 | Bias |
| ELGG3 | 153 | 33 | 5.4 | 2.7 | 3 | 3 | 3 | 1 | 2 | Standard Deviation |

Continued →

| Identifier | N Obs. | NGE | SD | Bias | B | E | F | T | W | Comments |
|---|---|---|---|---|---|---|---|---|---|---|
| ELJL8 | 162 | 4 | 1.4 | 6.6 | 3 | 3 | 3 | 2 | 3 | Bias |
| ELRR2 | 40 | 0 | 1.0 | -5.2 | 0 | 0 | 5 | 1 | 5 | Bias |
| ELVJ9 * | 248 | 0 | 1.8 | -5.2 | 4 | 4 | 4 | 1 | 4 | Bias |
| ELVY8 * | 152 | 16 | 1.6 | -3.4 | 2 | 2 | 2 | 1 | 2 | Bias |
| ELWR | 310 | 1 | 1.7 | -6.9 | 6 | 6 | 6 | 3 | 6 | Bias |
| ELXZ7 | 121 | 0 | 1.4 | -3.8 | 0 | 0 | 0 | 0 | 0 | Bias |
| ELYM3 | 77 | 0 | 1.8 | -4.1 | 2 | 1 | 0 | 0 | 2 | Bias |
| H3EP | 133 | 0 | 2.7 | -6.5 | 3 | 3 | 2 | 2 | 3 | Bias |
| KHRP | 232 | 0 | 3.8 | 4.0 | 3 | 3 | 3 | 2 | 3 | Bias |
| KIRH | 199 | 0 | 1.5 | -3.0 | 0 | 0 | 0 | 0 | 0 | Bias at end of period |
| KMJL * | 280 | 0 | 2.0 | -3.6 | 1 | 1 | 0 | 0 | 0 | Bias |
| LAFQ5 * | 148 | 4 | 1.4 | -7.4 | 3 | 3 | 3 | 0 | 4 | Bias |
| LAOW5 | 65 | 0 | 3.2 | 7.8 | 3 | 1 | 2 | 0 | 2 | Bias |
| OJAK | 166 | 4 | 1.4 | -4.0 | 2 | 2 | 1 | 0 | 0 | Bias |
| OUSE6 | 75 | 0 | 2.6 | -3.2 | 0 | 0 | 1 | 0 | 0 | Bias at end of period |
| OUVZ2 | 60 | 0 | 0.7 | -6.5 | 2 | 2 | 2 | 0 | 2 | Bias |
| OXIF2 | 128 | 0 | 1.4 | -3.7 | 1 | 1 | 0 | 0 | 1 | Bias |
| OXYH2 | 428 | 0 | 1.3 | -3.5 | 0 | 0 | 0 | 0 | 0 | Bias |
| PCAG * | 261 | 6 | 3.2 | -3.3 | 2 | 2 | 2 | 1 | 2 | Bias |
| PDBY | 178 | 0 | 0.9 | -3.2 | 0 | 0 | 0 | 0 | 0 | Bias |
| PJJU | 133 | 3 | 4.2 | 1.5 | 0 | 0 | 0 | 0 | 0 | Bias and SD from April |
| P3NB5 | 100 | 0 | 1.6 | -3.5 | 1 | 0 | 0 | 0 | 0 | Bias |
| P3YR5 * | 160 | 1 | 1.8 | 6.0 | 4 | 4 | 4 | 0 | 4 | Bias |
| P3YS5 * | 179 | 0 | 1.5 | 4.7 | 3 | 2 | 3 | 0 | 3 | Bias |
| SK000 | 112 | 0 | 1.4 | -5.2 | 2 | 2 | 2 | 0 | 2 | Bias |
| UAIS * | 76 | 27 | 5.2 | -7.6 | 2 | 2 | 2 | 0 | 2 | Gross Errors |
| UAMR | 312 | 16 | 1.6 | -12.2 | 4 | 4 | 4 | 3 | 4 | Bias |
| UANF | 118 | 0 | 1.7 | -3.7 | 1 | 1 | 1 | 1 | 1 | Bias |
| UASP | 55 | 0 | 1.9 | 3.4 | 1 | 0 | 0 | 1 | 0 | Bias |
| UASX | 59 | 0 | 1.4 | 7.2 | 2 | 2 | 2 | 2 | 2 | Bias |
| UBAU | 66 | 0 | 2.1 | -4.0 | 1 | 1 | 1 | 0 | 1 | Bias |
| UBDA | 45 | 0 | 2.5 | 3.8 | 0 | 0 | 0 | 0 | 0 | Bias |
| UBDL | 84 | 14 | 4.7 | 0.8 | 1 | 1 | 0 | 0 | 0 | Standard Deviation |
| UBDP | 47 | 10 | 4.1 | 2.2 | 0 | 0 | 0 | 0 | 0 | Gross Errors |
| UCAC | 159 | 0 | 2.3 | 5.6 | 3 | 3 | 3 | 2 | 3 | Bias |
| UCJB | 247 | 5 | 1.5 | -4.5 | 4 | 2 | 2 | 0 | 2 | Bias |
| UCJL | 99 | 0 | 1.6 | 5.2 | 3 | 3 | 3 | 0 | 3 | Bias |
| UCKG | 63 | 1 | 2.6 | -6.6 | 1 | 1 | 1 | 0 | 1 | Bias |
| UCTQ | 48 | 0 | 5.0 | -1.1 | 0 | 0 | 0 | 0 | 0 | Standard Deviation |
| UCUE | 111 | 58 | 6.3 | -4.5 | 1 | 4 | 1 | 0 | 4 | Bias and SD |

Continued →

| Identifier | N Obs. | NGE | SD | Bias | B | E | F | T | W | Comments |
|---|---|---|---|---|---|---|---|---|---|---|
| UDDE * | 158 | 1 | 2.1 | 4.8 | 3 | 3 | 3 | 1 | 4 | Bias |
| UDYG * | 572 | 56 | 6.4 | 3.9 | 6 | 6 | 6 | 4 | 6 | Bias erratic |
| UGWB * | 54 | 0 | 1.7 | 8.8 | 0 | 0 | 0 | 0 | 0 | Bias |
| UHLE * | 234 | 2 | 1.7 | -10.5 | 4 | 3 | 3 | 2 | 4 | Bias |
| UHVW * | 122 | 2 | 3.3 | 5.6 | 4 | 3 | 3 | 0 | 4 | Bias |
| UIDS * | 74 | 11 | 8.3 | 4.7 | 1 | 2 | 0 | 1 | 2 | Bias and Gross Errors |
| UIKI | 267 | 1 | 1.2 | 2.7 | 0 | 1 | 0 | 0 | 0 | Bias from April |
| VCJM * | 158 | 155 | 0.8 | -10.7 | 3 | 2 | 3 | 0 | 4 | Bias |
| VCRT * | 245 | 2 | 1.9 | -5.2 | 6 | 6 | 6 | 2 | 5 | Bias |
| VDWC | 44 | 38 | 1.6 | -5.3 | 1 | 0 | 1 | 0 | 2 | Bias |
| VGDT | 53 | 0 | 3.1 | -3.8 | 0 | 0 | 0 | 0 | 0 | Bias |
| VGJC * | 57 | 25 | 8.1 | 0.2 | 1 | 0 | 0 | 0 | 1 | Gross Errors |
| VRVI2 * | 152 | 0 | 1.0 | 5.3 | 2 | 2 | 2 | 1 | 2 | Bias |
| VTST | 107 | 0 | 5.5 | 0.0 | 3 | 3 | 2 | 0 | 3 | Bias and SD |
| VVGC | 168 | 5 | 3.3 | 9.2 | 3 | 3 | 3 | 1 | 3 | Bias, SD at end of period |
| WAFA | 52 | 0 | 1.5 | 2.9 | 0 | 0 | 0 | 0 | 1 | Bias at end of period |
| WAZ9548 | 65 | 2 | 3.9 | -6.0 | 1 | 0 | 1 | 0 | 1 | Bias |
| WCV7620 | 62 | 0 | 1.4 | 3.2 | 1 | 0 | 0 | 0 | 0 | Bias |
| WCV8696 | 64 | 0 | 2.0 | -3.5 | 1 | 0 | 0 | 1 | 0 | Bias |
| WCX8884 | 84 | 0 | 4.1 | 3.9 | 2 | 0 | 2 | 2 | 2 | Bias |
| WE6970 * | 53 | 1 | 1.8 | -3.5 | 1 | 0 | 1 | 0 | 1 | Bias |
| WWXA * | 110 | 0 | 1.8 | -5.4 | 1 | 1 | 4 | 2 | 4 | Bias |
| 3FHF8 | 112 | 0 | 0.9 | -4.4 | 3 | 2 | 1 | 1 | 1 | Bias |
| 3FPA6 | 60 | 38 | 7.8 | -5.6 | 1 | 1 | 0 | 1 | 1 | Bias and SD |
| 3FRT5 | 73 | 0 | 1.9 | 2.9 | 1 | 1 | 0 | 0 | 0 | Bias at end of period |
| 3FWP3 | 147 | 0 | 1.6 | 2.7 | 2 | 1 | 2 | 1 | 2 | Bias at end of period |
| 3FYM9 | 47 | 4 | 1.5 | -7.4 | 0 | 0 | 0 | 0 | 0 | Gross Errors |
| 4XGV * | 136 | 1 | 1.9 | 6.3 | 4 | 3 | 4 | 1 | 4 | Bias |
| 62137 | 129 | 0 | 1.2 | -6.3 | 2 | 1 | 2 | 1 | 2 | Bias |
| 62151 | 98 | 0 | 4.0 | 5.5 | 2 | 0 | 1 | 0 | 1 | Bias |
| 62155 | 525 | 3 | 2.7 | 0.2 | 0 | 0 | 0 | 0 | 0 | Bias at end of period |
| 64049 | 95 | 0 | 3.8 | -0.3 | 0 | 0 | 0 | 0 | 0 | SD at end of period |
| 8PNI * | 63 | 1 | 1.1 | -4.5 | 1 | 1 | 1 | 0 | 1 | Bias |
| 9VDI | 76 | 0 | 3.1 | -3.2 | 0 | 0 | 0 | 0 | 0 | Bias |

## TABLE 4: LIST OF PLATFORMS REPORTING IN SHIP CODE NOT APPEARING IN TABLE 3 BUT LISTED AS SUSPECT OVER THE PERIOD JULY TO DECEMBER 2000.

| | | |
|---|---|---|
| Column | 1 | Call sign or identifier. |
| Column | 2 | Number of pressure observations available for monitoring over the 6-month period, excluding duplicates, but including any observations with gross errors. |
| Column | 3 | Number of pressure observations differing by more than 15 hPa from background (gross error). |
| Column | 4 | Standard deviation of observation-minus-background differences excluding cases of gross error. |
| Column | 5 | Mean of observation-minus-background differences (bias) excluding cases of gross error. |
| Column | 6 | Comments on quality of pressure observations. |

*Notes*: 1. Units are hPa

| Identifier | N Obs. | NGE | SD | Bias | Comments |
|---|---|---|---|---|---|
| CGDX | 104 | 0 | 1.4 | 1.3 | No Gross Errors |
| CG2522 | 43 | 1 | 1.9 | -0.6 | Bias reduced |
| CG2960 | 708 | 302 | 2.3 | 1.0 | Bias and GE reduced |
| C6JV4 | 33 | 0 | 2.4 | 5.3 | Less than 40 reports |
| C6QE3 | 188 | 0 | 1.6 | 2.4 | Bias reduced |
| C6RF6 | 0 | --- | --- | --- | No reports |
| DVRVW6D | 0 | --- | --- | --- | No reports |
| DYZM | 16 | 9 | 2.5 | -12.2 | Less than 40 reports |
| ELGN6 | 38 | 0 | 6.5 | 4.4 | Less than 40 reports |
| ELMQ | 0 | --- | --- | --- | No reports |
| ELRU8 | 106 | 0 | 1.1 | 0.6 | SD reduced |
| ELTQ6 | 23 | 0 | 2.2 | 0.6 | Less than 40 reports |
| ELWR3 | 37 | 0 | 1.1 | -5.1 | Less than 40 reports |
| ELXA8 | 148 | 3 | 3.8 | 0.3 | SD and Bas reduced |
| GQVM | 212 | 0 | 1.8 | -0.4 | Bias reduced |
| KSBG | 0 | --- | --- | --- | No reports |
| MXAR9 | 112 | 1 | 1.7 | 0.6 | Bias and SD reduced |
| OXUF2 | 0 | --- | --- | --- | No reports |
| OZBW6 | 35 | 0 | 0.9 | -3.7 | Less than 40 reports |
| OZLB | 24 | 0 | 0.7 | -3.3 | Less than 40 reports |
| PFSJ | 357 | 0 | 1.5 | 0.5 | SD and Bias reduced |
| SYMK | 1 | 0 | 0.0 | 5.3 | Less than 40 reports |
| UANA | 113 | 0 | 1.3 | -1.2 | Bias reduced |
| UBCB | 0 | --- | --- | --- | No reports |
| UBDN | 160 | 0 | 1.7 | 3.9 | Bias reduced |

Continued →

| Identifier | N Obs. | NGE | SD | Bias | Comments |
|---|---|---|---|---|---|
| UBHT | 0 | --- | --- | --- | No reports |
| UCUC | 73 | 3 | 2.4 | -1.0 | Gross Errors reduced |
| UCUF | 143 | 0 | 4.7 | -2.3 | Bias reduced |
| UDDC | 0 | --- | --- | --- | No reports |
| UDUK | 175 | 0 | 1.8 | 4.4 | Bias reduced |
| UDYO | 0 | --- | --- | --- | No reports |
| UEFE | 4 | 0 | 1.3 | -0.7 | Less than 40 reports |
| UFNH | 148 | 0 | 3.9 | -3.6 | Bias reduced |
| UFXA | 180 | 8 | 1.3 | 0.4 | Bias reduced |
| UHVF | 11 | 0 | 1.0 | 2.1 | Less than 40 reports |
| UICO | 0 | --- | --- | --- | No reports |
| UICP | 0 | --- | --- | --- | No reports |
| VCPX | 120 | 0 | 1.3 | -2.8 | Bias reduced |
| VDFP | 2 | 0 | 1.5 | -0.2 | Less than 40 reports |
| VGCY | 3 | 0 | 2.2 | -2.1 | Less than 40 reports |
| VGFQ | 224 | 1 | 2.5 | -2.1 | Gross Errors reduced |
| VGRT | 0 | --- | --- | --- | No reports |
| VGXD | 24 | 8 | 4.1 | 2.2 | Less than 40 reports |
| VOXZ | 0 | --- | --- | --- | No reports |
| VRVI | 4 | 0 | 0.7 | 5.2 | Less than 40 reports |
| VVMA | 62 | 0 | 2.7 | 4.1 | Bias reduced |
| V7BA6 | 0 | --- | --- | --- | No reports |
| V7BW9 | 28 | 0 | 0.9 | -4.3 | Less than 40 reports |
| WCN4995 | 96 | 1 | 2.6 | 2.0 | Bias reduced |
| WCZ9380 | 85 | 1 | 1.8 | -3.1 | Bias reduced |
| WQZ7049 | 144 | 3 | 2.2 | -1.4 | Bias reduced |
| WTDF | 237 | 1 | 0.9 | -1.9 | Bias reduced |
| WXN3191 | 49 | 0 | 1.8 | -1.2 | Bias reduced |
| 23517 | 0 | --- | --- | --- | No reports |
| 23589 | 0 | --- | --- | --- | No reports |
| 23925 | 0 | --- | --- | --- | No reports |
| 26201 | 0 | --- | --- | --- | No reports |
| 29090 | 0 | --- | --- | --- | No reports |
| 3FEA4 | 37 | 0 | 2.8 | -4.5 | Less than 40 reports |
| 3FGN3 | 87 | 4 | 3.0 | -1.6 | Bias reduced |
| 3FSN8 | 1271 | 1 | 1.0 | -0.7 | Gross Errors reduced |
| 31960 | 0 | --- | --- | --- | No reports |
| 33903 | 0 | --- | --- | --- | No reports |
| 41529 | 0 | --- | --- | --- | No reports |
| 41530 | 0 | --- | --- | --- | No reports |

Continued →

| Identifier | N Obs. | NGE | SD | Bias | Comments |
|---|---|---|---|---|---|
| 44138 | 2 | 0 | 0.5 | -0.8 | Less than 40 reports |
| 46608 | 0 | --- | --- | --- | No reports |
| 53510 | 0 | --- | --- | --- | No reports |
| 56542 | 0 | --- | --- | --- | No reports |
| 61524 | 0 | --- | --- | --- | No reports |
| 62597 | 0 | --- | --- | --- | No reports |
| 64546 | 0 | --- | --- | --- | No reports |
| 8PPF | 1 | 0 | 0.0 | -4.6 | Less than 40 reports |
| 9MBX5 | 181 | 0 | 3.8 | 3.7 | Bias reduced |
| 9MCU | 27 | 0 | 1.5 | 4.3 | Less than 40 reports |
| 9VIH | 20 | 0 | 1.4 | 0.2 | Less than 40 reports |
| 9VOG | 0 | --- | --- | --- | No reports |
| 9VRA | 350 | 0 | 3.5 | -2.7 | Bias reduced |

## TABLE 5: LIST OF MARINE OBSERVING PLATFORMS REPORTING SUSPECT WIND SPEED OBSERVATIONS OVER THE PERIOD JANUARY TO JUNE 2001.

| | | |
|---|---|---|
| Column | 1 | Call sign or identifier. |
| Column | 2 | Number of wind speed observations available for monitoring over the 6-month period, excluding duplicates, but including any observations with gross errors. |
| Column | 3 | Number of wind observations with vector difference from background of more than 25ms $^{-1}$ (gross error). |
| Column | 4 | Standard deviation of observation-minus-background differences excluding cases of gross error. |
| Column | 5 | Mean of observation-minus-background differences (bias) excluding cases of gross error. |
| Column | 6-10 | Number of times observing platform has appeared on suspect lists. B=Bracknell, E=ECMWF, F=MétéoFrance, T=Tokyo, W=Washington. |
| Column | 11 | Comments on quality of wind speed observations. |

*Notes*:
1. Units are ms$^{-1}$
2. Observing platforms marked with an asterisk were listed in the previous report (July to December 2000)

### Table 5a: Platforms reporting in BUOY code

*i): Platforms **non-operational** at the end of the reporting period*

| Identifier | N Obs. | NGE | SD | Bias | B | E | F | T | W | Comments |
|---|---|---|---|---|---|---|---|---|---|---|
| 23913 | 772 | 14 | 2.2 | 0.1 | 0 | 0 | 0 | 0 | 0 | Gross Errors |
| 41502 | 476 | 0 | 2.7 | -4.5 | 1 | 1 | 1 | 0 | 0 | Bias |
| 41594 | 790 | 137 | 5.7 | 6.1 | 2 | 1 | 2 | 0 | 1 | Standard Deviation |
| 44743 | 3222 | 7 | 2.4 | -1.2 | 0 | 0 | 0 | 0 | 0 | Bias |
| 46660 | 506 | 84 | 3.3 | -5.6 | 2 | 2 | 1 | 1 | 2 | Bias |
| 46701 | 73 | 0 | 2.2 | -5.9 | 1 | 1 | 1 | 0 | 1 | Bias |
| 52523 | 472 | 0 | 3.2 | -4.6 | 2 | 2 | 2 | 0 | 2 | Bias |
| 62505 | 251 | 0 | 3.6 | -4.5 | 0 | 0 | 0 | 0 | 0 | Bias |
| 62557 | 1196 | 0 | 3.3 | -0.8 | 1 | 1 | 1 | 1 | 1 | Bias |
| 62562 | 107 | 3 | 7.2 | 1.9 | 0 | 0 | 0 | 0 | 0 | Bias and SD |

*ii): Platforms **operational** at the end of the reporting period*

| Identifier | N Obs. | NGE | SD | Bias | B | E | F | T | W | Comments |
|---|---|---|---|---|---|---|---|---|---|---|
| 17557 | 4235 | 0 | 2.2 | -4.9 | 3 | 2 | 1 | 3 | 1 | Bias |
| 41639 | 1367 | 4 | 4.4 | 3.8 | 2 | 2 | 2 | 2 | 2 | Bias |

Table 5b: Platforms reporting in SHIP code

| Identifier | N Obs. | NGE | SD | Bias | B | E | F | T | W | Comments |
|---|---|---|---|---|---|---|---|---|---|---|
| C6NI3 * | 168 | 0 | 3.7 | 4.3 | 1 | 0 | 2 | 0 | 0 | Bias |
| C6NR5 | 180 | 1 | 5.2 | 3.0 | 1 | 1 | 1 | 0 | 1 | Bias |
| DAPP | 55 | 1 | 4.8 | 5.5 | 0 | 0 | 0 | 0 | 0 | Bias and SD |
| DFRZ | 161 | 3 | 4.8 | 4.7 | 1 | 0 | 1 | 0 | 0 | Bias |
| DHDH | 92 | 0 | 5.6 | 4.6 | 1 | 0 | 1 | 0 | 0 | Bias |
| DPBP | 142 | 0 | 4.0 | 4.3 | 0 | 0 | 0 | 0 | 0 | Bias at end of period |
| ELUT5 | 250 | 1 | 3.2 | 3.5 | 1 | 0 | 2 | 0 | 0 | Bias from April |
| ELVG2 | 129 | 41 | 4.7 | 6.0 | 4 | 4 | 4 | 1 | 4 | Bias at end of period |
| ELWP8 | 205 | 5 | 6.0 | 8.4 | 6 | 2 | 6 | 0 | 4 | Bias and SD |
| ELWZ5 | 148 | 1 | 4.7 | 5.7 | 5 | 3 | 5 | 0 | 1 | Bias |
| ELXT8 * | 195 | 2 | 6.1 | 10.2 | 4 | 4 | 4 | 1 | 4 | Bias and SD |
| FKWK | 492 | 415 | 7.6 | 9.1 | 3 | 2 | 3 | 0 | 3 | Bias and SD |
| FNID | 91 | 0 | 4.4 | 6.2 | 1 | 1 | 1 | 0 | 1 | Bias |
| JKPS | 222 | 1 | 3.9 | 5.4 | 3 | 1 | 1 | 1 | 1 | Bias |
| LAHG2 | 85 | 0 | 3.6 | 4.2 | 1 | 0 | 0 | 0 | 0 | Bias at end of period |
| MXAR9 | 136 | 2 | 7.7 | 1.5 | 1 | 0 | 0 | 0 | 0 | Bias and SD at end of period |
| OUGV | 56 | 2 | 7.5 | 3.4 | 0 | 1 | 1 | 0 | 0 | Standard Deviation |
| OWRN2 | 155 | 1 | 5.8 | 6.1 | 1 | 1 | 4 | 0 | 3 | Bias |
| OYBZ | 113 | 1 | 5.1 | 2.5 | 0 | 0 | 0 | 0 | 0 | SD at end of period |
| OYCZ | 79 | 3 | 6.3 | 9.2 | 2 | 1 | 2 | 0 | 2 | Bias and SD at end of period |
| PJIB | 203 | 2 | 5.3 | 8.2 | 4 | 4 | 4 | 1 | 4 | Bias |
| PPSO * | 211 | 0 | 5.4 | 7.8 | 5 | 5 | 5 | 1 | 5 | Bias |
| SFRZ | 296 | 6 | 6.6 | 6.0 | 3 | 3 | 3 | 1 | 3 | Bias |
| SXYY * | 236 | 2 | 5.6 | 7.5 | 3 | 4 | 4 | 0 | 2 | Bias |
| UCJU | 280 | 7 | 3.4 | 2.8 | 0 | 0 | 0 | 0 | 0 | Bias |
| UCUE | 127 | 2 | 4.4 | 4.1 | 0 | 2 | 0 | 0 | 2 | Bias |
| UIDS | 74 | 16 | 4.9 | 2.7 | 1 | 2 | 0 | 0 | 2 | Gross Errors |
| VLST * | 2359 | 0 | 3.2 | 5.0 | 1 | 0 | 6 | 2 | 1 | Bias |
| VRRD * | 63 | 0 | 4.6 | 6.8 | 0 | 0 | 0 | 0 | 0 | Bias |
| VRVJ5 | 102 | 61 | 6.9 | 3.6 | 2 | 2 | 0 | 1 | 2 | Gross Errors |
| V2FN | 43 | 0 | 6.0 | 6.6 | 1 | 1 | 1 | 0 | 1 | Bias |
| V2PB1 | 114 | 6 | 5.4 | 8.5 | 2 | 2 | 2 | 0 | 2 | Bias and SD |
| WAQ3521 | 49 | 0 | 3.9 | 5.7 | 0 | 0 | 1 | 0 | 0 | Bias |
| WCP9556 | 62 | 0 | 5.9 | 3.9 | 0 | 0 | 1 | 0 | 0 | Bias |
| 3ESP7 | 276 | 1 | 5.2 | 3.7 | 1 | 1 | 1 | 1 | 1 | Bias |
| 3FWM4 | 51 | 0 | 2.6 | 5.4 | 1 | 0 | 1 | 0 | 0 | Bias |

# TABLE 6: LIST OF PLATFORMS REPORTING IN SHIP CODE NOT APPEARING IN TABLE 5 BUT LISTED AS SUSPECT OVER THE PERIOD JULY TO DECEMBER 2000.

| | | |
|---|---|---|
| Column | 1 | Call sign or identifier. |
| Column | 2 | Number of wind speed observations available for monitoring over the 6-month period, excluding duplicates, but including any observations with gross errors. |
| Column | 3 | Number of wind observations with vector difference from background of more than 25ms$^{-1}$ (gross error). |
| Column | 4 | Standard deviation of observation-minus-background differences excluding cases of gross error. |
| Column | 5 | Mean of observation-minus-background differences (bias) excluding cases of gross error. |
| Column | 6 | Comments on quality of wind speed observations. |

*Notes*: 1. Units are ms$^{-1}$

| Identifier | N Obs. | NGE | SD | Bias | Comments |
|---|---|---|---|---|---|
| A3CW5 | 0 | --- | --- | --- | No reports |
| DBBA | 3933 | 0 | 2.5 | -1.1 | Bias reduced |
| DGCDFD | 5 | 0 | 1.5 | 2.0 | Less than 40 reports |
| DGGH | 0 | --- | --- | --- | No reports |
| ELRJ3 | 0 | --- | --- | --- | No reports |
| ELTQ6 | 23 | 0 | 2.8 | -0.3 | Less than 40 reports |
| ELVM6 | 2343 | 3 | 2.8 | 2.2 | Bias reduced |
| ELVO5 | 0 | --- | --- | --- | No reports |
| ELWC6 | 0 | --- | --- | --- | No reports |
| ELXE3 | 108 | 1 | 7.0 | 5.2 | Bias and SD reduced |
| ELXS5 | 0 | --- | --- | --- | No reports |
| FNEH | 130 | 0 | 3.5 | 3.8 | Bias reduced |
| GFWX | 0 | --- | --- | --- | No reports |
| LAJV4 | 250 | 2 | 4.1 | 3.3 | Bias reduced |
| MQPU6 | 41 | 3 | 5.4 | 6.1 | Bias and SD reduced |
| MRDP6 | 3 | 0 | 4.5 | 9.8 | Less than 40 reports |
| PJOD | 304 | 3 | 4.8 | 4.6 | Bias and SD reduced |
| PJVB | 200 | 0 | 2.6 | 1.2 | Bias reduced |
| P3RX4 | 138 | 6 | 6.1 | 10.5 | Bias reduced |
| SWSK | 0 | --- | --- | --- | No reports |
| S6JR | 50 | 1 | 3.4 | 1.1 | SD reduced |
| UHQP | 192 | 0 | 3.1 | 0.2 | SD reduced |
| VCRT | 246 | 3 | 4.1 | 4.5 | Bias reduced |
| VGLZ | 168 | 0 | 4.1 | 5.4 | Bias reduced |
| WAQ2746 | 244 | 0 | 4.4 | 4.6 | Bias reduced |

Continued →

| Identifier | N Obs. | NGE | SD | Bias | Comments |
|---|---|---|---|---|---|
| ZCAO7 | 373 | 1 | 4.6 | 2.4 | Bias reduced |
| ZCBU8 | 109 | 2 | 3.8 | 4.8 | Bias reduced |
| 22905 | 0 | --- | --- | --- | No reports |
| 3FJR8 | 10 | 0 | 4.7 | 8.0 | Less than 40 reports |
| 3FTW | 0 | --- | --- | --- | No reports |
| 44145 | 1410 | 0 | 3.7 | 4.8 | Bias reduced |
| 62108 | 0 | --- | --- | --- | No reports |
| 63116 | 245 | 0 | 3.7 | -4.1 | Bias reduced |
| 9MUG | 0 | --- | --- | --- | No reports |
| 9VVI | 32 | 0 | 2.9 | 3.4 | Less than 40 reports |

## TABLE 7: LIST OF MARINE OBSERVING PLATFORMS PRODUCING SUSPECT WIND DIRECTION OBSERVATIONS OVER THE PERIOD JANUARY TO JUNE 2001 .

| | | |
|---|---|---|
| Column | 1 | Call sign or identifier. |
| Column | 2 | Number of wind direction observations available for monitoring over the 6-month period, excluding duplicates, but including any observations with gross errors. |
| Column | 3 | Number of wind observations with vector difference from background of more than 25ms$^{-1}$ (gross error). |
| Column | 4 | Standard deviation of observation-minus-background differences excluding cases of gross error. |
| Column | 5 | Mean of observation-minus-background differences (bias) excluding cases of gross error. |
| Column | 6-10 | Number of times observing platform has appeared on suspect lists. B=Bracknell, E=ECMWF, F=MétéoFrance, T=Tokyo, W=Washington. |
| Column | 11 | Comments on quality of wind direction observations. |

*Notes:*

1. Units are degrees ( ° ).
2. Observing platforms marked § had a significant bias at some time within the period and the statistics and their plots refer to direction reports associated with background wind speeds greater than 5 ms$^{-1}$. If no significant speed bias was present, the statistics and plots refer to direction reports with an observed speed greater than 5 ms$^{-1}$.
3. Observing platforms marked with an asterisk were listed in the previous report (July to December 2000)

### Table 7a: Platforms reporting in BUOY code

*i): Platforms **non-operational** at the end of the reporting period*

| Identifier | N Obs. | NGE | SD | Bias | B | E | F | T | W | Comments |
|---|---|---|---|---|---|---|---|---|---|---|
| 23913 | 772 | 14 | 69.4 | 33.3 | 1 | 0 | 1 | 1 | 1 | Bias at end of period |
| 23948 | 114 | 6 | 3.0 | 147.9 | 1 | 0 | 1 | 1 | 1 | Bias |
| 31980 | 594 | 1 | 96.2 | -51.4 | 0 | 2 | 2 | 1 | 3 | Bias and Standard Deviation |
| 41594 § | 790 | 101 | 49.2 | -40.3 | 2 | 2 | 2 | 1 | 2 | Gross Errors and Bias |
| 46660 § | 506 | 84 | 117.1 | 47.7 | 2 | 2 | 2 | 1 | 2 | Bias and Standard Deviation |
| 62561 | 135 | 0 | 64.0 | -15.4 | 0 | 1 | 1 | 0 | 1 | Standard Deviation |

*ii): Platforms **operational** at the end of the reporting period*

| Identifier | N Obs. | NGE | SD | Bias | B | E | F | T | W | Comments |
|---|---|---|---|---|---|---|---|---|---|---|

## Table 7b: Platforms reporting in SHIP code

| Identifier | N Obs. | NGE | SD | Bias | B | E | F | T | W | Comments |
|---|---|---|---|---|---|---|---|---|---|---|
| BKJI | 60 | 0 | 60.5 | 12.6 | 0 | 0 | 0 | 0 | 0 | Standard Deviation |
| CG2248 | 139 | 0 | 51.7 | -31.4 | 0 | 0 | 0 | 0 | 2 | Bias |
| CG2260 | 108 | 0 | 64.7 | 10.9 | 0 | 0 | 0 | 0 | 1 | Standard Deviation |
| C6FN4 | 95 | 1 | 50.1 | -49.2 | 0 | 0 | 0 | 0 | 0 | Bias |
| C6IU4 | 144 | 1 | 69.7 | -8.3 | 0 | 0 | 0 | 0 | 1 | Standard Deviation |
| C6OT7 | 60 | 0 | 82.7 | 14.8 | 1 | 1 | 0 | 0 | 2 | Standard Deviation |
| DJPL | 57 | 0 | 66.9 | -36.4 | 0 | 0 | 1 | 0 | 0 | Bias and SD |
| DUGZ | 83 | 0 | 60.9 | -5.1 | 0 | 0 | 0 | 0 | 0 | Standard Deviation |
| ELOT3 | 158 | 0 | 68.4 | 0.3 | 0 | 0 | 0 | 0 | 2 | Standard Deviation |
| ELQO6 | 80 | 0 | 61.7 | 2.3 | 0 | 0 | 0 | 0 | 2 | Standard Deviation |
| ELRY5 | 63 | 0 | 63.9 | 2.1 | 0 | 0 | 0 | 0 | 1 | Standard Deviation |
| ELVS2 | 169 | 4 | 65.0 | -0.2 | 0 | 0 | 0 | 0 | 2 | Standard Deviation |
| ELWR8 | 70 | 0 | 65.9 | -6.8 | 0 | 0 | 0 | 0 | 0 | Standard Deviation |
| ELYD4 | 59 | 0 | 68.6 | 8.5 | 0 | 0 | 0 | 0 | 0 | Standard Deviation |
| FKWK § | 492 | 82 | 67.2 | 10.2 | 2 | 1 | 3 | 0 | 3 | Gross Errors |
| FPSS | 525 | 6 | 94.6 | 3.0 | 4 | 4 | 4 | 1 | 4 | Standard Deviation |
| MSQK3 | 286 | 1 | 63.4 | -10.8 | 0 | 0 | 0 | 0 | 1 | Standard Deviation |
| NMRY | 113 | 1 | 64.5 | 13.9 | 1 | 0 | 0 | 0 | 0 | Standard Deviation |
| OWDD | 99 | 0 | 72.5 | 2.8 | 0 | 0 | 0 | 0 | 2 | Standard Deviation |
| PJJU | 135 | 0 | 63.8 | -16.0 | 0 | 0 | 0 | 0 | 1 | Bias and Standard Deviation |
| P3RF8 | 161 | 1 | 61.7 | -9.5 | 0 | 0 | 0 | 0 | 1 | Standard Deviation |
| SBPR | 311 | 0 | 60.8 | 4.5 | 0 | 0 | 0 | 0 | 0 | Standard Deviation |
| SCFH | 58 | 0 | 64.5 | -11.0 | 0 | 0 | 0 | 0 | 0 | Standard Deviation |
| S6JM § | 216 | 35 | 70.7 | 3.8 | 1 | 0 | 0 | 0 | 1 | Bias and Standard Deviation |
| UAZX | 57 | 0 | 60.4 | 6.1 | 0 | 0 | 0 | 0 | 0 | Standard Deviation |
| UBDP * | 47 | 0 | 106.2 | 20.2 | 0 | 0 | 0 | 0 | 0 | Standard Deviation |
| UBXS | 134 | 1 | 56.2 | 32.3 | 0 | 2 | 0 | 0 | 0 | Bias |
| UCUF | 131 | 1 | 78.0 | -15.7 | 0 | 0 | 0 | 0 | 1 | Standard Deviation |
| UDCY | 175 | 1 | 64.0 | -9.8 | 0 | 0 | 0 | 0 | 3 | Standard deviation |
| UDYG * | 558 | 7 | 62.8 | 1.6 | 0 | 0 | 1 | 0 | 2 | Bias and Standard Deviation |
| UFNH *§ | 145 | 1 | 39.7 | 45.0 | 0 | 1 | 1 | 0 | 2 | Bias |
| UGTV | 107 | 0 | 60.8 | 3.5 | 0 | 0 | 0 | 0 | 4 | Standard deviation |
| UIDS | 70 | 10 | 95.8 | -4.1 | 0 | 0 | 0 | 0 | 4 | Standard Deviation |
| VRVJ5 § | 99 | 28 | 74.5 | -5.1 | 1 | 0 | 0 | 0 | 2 | Standard Deviation |
| VVGC | 164 | 0 | 66.5 | 6.3 | 0 | 0 | 0 | 0 | 1 | Standard Deviation |
| V2EA4 | 84 | 4 | 125.1 | 35.0 | 0 | 0 | 0 | 0 | 0 | Bias and Standard Deviation |
| V7AT9 § | 215 | 1 | 48.9 | -34.6 | 0 | 0 | 0 | 0 | 3 | Bias |
| WBN438 * | 286 | 0 | 68.2 | -12.0 | 0 | 0 | 0 | 0 | 3 | Bias and Standard Deviation |
| WBO2511 | 171 | 1 | 71.5 | -25.0 | 0 | 0 | 0 | 0 | 2 | Bias and Standard Deviation |
| WCN4995 | 94 | 0 | 62.8 | -3.6 | 0 | 0 | 0 | 0 | 1 | Standard Deviation |

Continued →

| Identifier | N Obs. | NGE | SD | Bias | B | E | F | T | W | Comments |
|---|---|---|---|---|---|---|---|---|---|---|
| WNGW | 86 | 0 | 63.2 | -21.1 | 0 | 0 | 0 | 0 | 1 | Standard Deviation |
| ZDDT5 § | 112 | 0 | 64.6 | 7.0 | 0 | 0 | 0 | 0 | 1 | Standard Deviation |
| 3FAV9 | 51 | 0 | 69.4 | -5.4 | 0 | 0 | 0 | 0 | 1 | Standard Deviation |
| 3FEY7 | 67 | 2 | 84.7 | 7.5 | 0 | 0 | 0 | 0 | 0 | Standard Deviation |
| 3FKD9 | 100 | 0 | 69.2 | 7.6 | 0 | 0 | 0 | 0 | 0 | Standard Deviation |
| 46025 * | 1348 | 0 | 45.1 | -49.2 | 0 | 0 | 0 | 0 | 1 | Bias |
| 46053 * | 1367 | 0 | 44.2 | -63.2 | 0 | 1 | 2 | 2 | 3 | Bias |
| 51308 | 566 | 0 | 44.8 | -42.1 | 0 | 0 | 1 | 0 | 0 | Bias |
| 52316 | 517 | 0 | 64.9 | -15.0 | 1 | 1 | 3 | 0 | 3 | SD at end of period |
| 62109 § | 1894 | 17 | 83.0 | 1.4 | 1 | 1 | 2 | 1 | 2 | Bias and Standard Deviation |
| 62131 | 480 | 0 | 33.1 | 30.6 | 1 | 0 | 2 | 0 | 4 | Bias |
| 62144 * | 4200 | 1 | 35.9 | 12.3 | 0 | 0 | 0 | 0 | 0 | Bias erratic |

## TABLE 8: LIST OF PLATFORMS REPORTING IN SHIP CODE NOT APPEARING IN TABLE 7 BUT LISTED AS SUSPECT OVER THE PERIOD JULY TO DECEMBER 2000.

| | | |
|---|---|---|
| Column | 1 | Call sign or identifier. |
| Column | 2 | Number of wind direction observations available for monitoring over the 6-month period, excluding duplicates, but including any observations with gross errors. |
| Column | 3 | Number of wind observations with vector difference from background of more than 25ms $^{-1}$ (gross error). |
| Column | 4 | Standard deviation of observation-minus-background differences excluding cases of gross error. |
| Column | 5 | Mean of observation-minus-background differences (bias) excluding cases of gross error. |
| Column | 6 | Comments on quality of wind direction observations. |

*Notes*: 1. Units are degrees ( ° )

| Identifier | N Obs. | NGE | SD | Bias | Comments |
|---|---|---|---|---|---|
| C6HS4 | 144 | 0 | 36.6 | 11.2 | Bias reduced |
| C6IO9 | 41 | 0 | 44.7 | 7.2 | Standard Deviation reduced |
| C6MX4 | 26 | 1 | 133.8 | 20.1 | Less than 40 reports |
| ELMQ | 0 | --- | --- | --- | No reports |
| ELVE5 | 3 | 0 | 0.0 | -96.7 | Less than 40 reports |
| ELWC6 | 0 | --- | --- | --- | No reports |
| KDGR | 37 | 0 | 43.5 | -35.0 | Less than 40 reports |
| MWRA9 | 0 | --- | --- | --- | No reports |
| SYQI | 13 | 0 | 79.2 | 27.2 | Less than 40 reports |
| UFJN | 186 | 2 | 48.3 | -9.9 | Standard Deviation reduced |
| UICO | 0 | --- | --- | --- | No reports |
| WCZ3758 | 66 | 0 | 51.2 | 9.0 | Standard Deviation reduced |
| ZCBD4 | 95 | 0 | 53.7 | 0.1 | Standard Deviation reduced |
| 3FMI6 | 8 | 0 | 46.9 | 20.9 | Less than 40 reports |
| 44773 | 0 | --- | --- | --- | No reports |
| 52643 | 0 | --- | --- | --- | No reports |
| 9VFC | 0 | --- | --- | --- | No reports |

# TABLE 9: LIST OF MARINE OBSERVING PLATFORMS REPORTING SUSPECT SEA SURFACE TEMPERATURE OBSERVATIONS OVER THE PERIOD JANUARY TO JUNE 2001.

| | | |
|---|---|---|
| Column | 1 | Call sign or identifier. |
| Column | 2 | Number of sea-surface temperature observations available for monitoring over the six-month period, excluding duplicates, but including any observations with gross errors. |
| Column | 3 | Number of sea surface temperature observations differing by more than 10 °C from background (gross error). |
| Column | 4 | Standard deviation of observation-minus-background differences excluding cases of gross error. |
| Column | 5 | Mean of observation-minus-background differences excluding cases of gross error. |
| Columns | 6-10 | Number of times observing platform has appeared on suspect lists. B=Bracknell, E=ECMWF, F=MétéoFrance, T=Tokyo, W=Washington. |
| Column | 11 | Comments on quality of sea surface temperature observations. |

*Notes*:
1. Units are °C
2. Observing platforms marked with an asterisk were listed in the previous report (July to December 2000)

## Table 9a: Platforms reporting in BUOY code

*i): Platforms **non-operational** at the end of the reporting period*

| Identifier | N Obs. | NGE | SD | Bias | B | E | F | T | W | Comments |
|---|---|---|---|---|---|---|---|---|---|---|
| 14559 | 242 | 238 | 0.9 | 0.0 | - | - | 0 | - | 1 | Gross Errors |
| 15537 | 85 | 0 | 0.5 | 4.9 | - | - | 1 | - | 1 | Bias |
| 17635 | 1738 | 784 | 0.3 | 9.3 | - | - | 6 | - | 6 | Gross Errors |
| 17645 | 827 | 163 | 0.1 | 0.2 | - | - | 1 | - | 1 | Gross Errors |
| 21599 | 87 | 0 | 2.0 | -2.8 | - | - | 0 | - | 0 | Bias |
| 21903 | 645 | 37 | 3.3 | -1.1 | - | - | 2 | - | 0 | Gross Errors |
| 22913 | 1790 | 2 | 1.8 | 1.0 | - | - | 0 | - | 0 | Bias at end of period |
| 23901 | 1315 | 0 | 1.8 | -0.5 | - | - | 1 | - | 0 | Bias at end of period |
| 23902 | 1168 | 0 | 1.7 | 2.1 | - | - | 0 | - | 1 | Bias at end of period |
| 23906 | 499 | 0 | 2.8 | -2.5 | - | - | 0 | - | 0 | Bias erratic |
| 23915 | 285 | 42 | 2.3 | 5.7 | - | - | 1 | - | 2 | Bias |
| 25540 | 596 | 7 | 2.0 | 2.8 | - | - | 2 | - | 1 | Bias |
| 25541 | 591 | 11 | 2.4 | 3.6 | - | - | 2 | - | 1 | Bias |
| 26511 | 627 | 38 | 2.4 | 4.0 | - | - | 2 | - | 2 | Bias |
| 32614 | 352 | 33 | 0.2 | 0.0 | - | - | 0 | - | 0 | Gross Errors |

Continued →

| Identifier | N Obs. | NGE | SD | Bias | B | E | F | T | W | Comments |
|---|---|---|---|---|---|---|---|---|---|---|
| 32807 | 280 | 280 | --- | --- | - | - | 2 | - | 2 | Gross Errors |
| 32810 | 191 | 23 | 2.1 | 4.5 | - | - | 0 | - | 1 | Gross Errors and Bias |
| 32829 | 214 | 197 | 5.1 | 2.4 | - | - | 2 | - | 2 | Gross Errors |
| 33560 | 3643 | 1028 | 1.5 | -0.4 | - | - | 2 | - | 2 | Gross Errors |
| 33571 | 745 | 0 | 1.1 | 1.4 | - | - | 0 | - | 0 | Bias |
| 41594 | 1583 | 0 | 2.3 | -1.8 | - | - | 0 | - | 0 | Bias at end of period |
| 41619 | 323 | 323 | --- | --- | - | - | 2 | - | 2 | Gross Errors |
| 41940 | 77 | 0 | 0.7 | 5.9 | - | - | 1 | - | 1 | Bias |
| 43532 | 55 | 46 | 3.0 | 3.7 | - | - | 1 | - | 1 | Gross Errors |
| 43912 | 1322 | 60 | 0.6 | -0.1 | - | - | 1 | - | 1 | Gross Errors |
| 44624 | 1972 | 0 | 1.0 | -4.1 | - | - | 1 | - | 1 | Bias |
| 44741 | 2826 | 1 | 0.9 | 0.2 | - | - | 0 | - | 0 | Bias at end of period |
| 44772 | 53 | 31 | 5.6 | -0.6 | - | - | 0 | - | 0 | Gross Errors |
| 46927 | 1469 | 22 | 1.0 | 0.3 | - | - | 0 | - | 0 | Bias at end of period |
| 51516 | 514 | 182 | 0.2 | -0.1 | - | - | 2 | - | 2 | Gross Errors |
| 51517 | 525 | 192 | 1.5 | -0.8 | - | - | 2 | - | 1 | Gross Errors and Bias |
| 51658 | 223 | 223 | --- | --- | - | - | 2 | - | 2 | Gross Errors |
| 51805 | 969 | 5 | 2.9 | 1.8 | - | - | 0 | - | 1 | Gross Errors and Bias |
| 51816 | 289 | 41 | 3.2 | -3.6 | - | - | 2 | - | 1 | Gross Errors and Bias |
| 51826 | 172 | 172 | --- | --- | - | - | 2 | - | 2 | Gross Errors |
| 52603 | 209 | 209 | --- | --- | - | - | 1 | - | 1 | Gross Errors |
| 52652 | 407 | 18 | 0.9 | -0.3 | - | - | 0 | - | 0 | Gross Errors |
| 53517 | 3781 | 0 | 3.5 | 2.4 | - | - | 2 | - | 2 | Bias from April |
| 54856 | 2284 | 2 | 1.0 | 0.3 | - | - | 0 | - | 0 | Bias at end of period |
| 55905 | 2185 | 1 | 0.9 | 1.1 | - | - | 0 | - | 0 | Bias at end of period |
| 55912 | 2079 | 5 | 2.0 | 4.1 | - | - | 4 | - | 3 | Bias |
| 61589 | 1421 | 811 | 5.5 | 0.8 | - | - | 5 | - | 5 | Gross Errors |
| 62509 | 296 | 0 | 2.4 | -0.8 | - | - | 0 | - | 0 | Bias |
| 62559 | 76 | 0 | 1.8 | -4.2 | - | - | 1 | - | 1 | Bias |
| 62844 | 1344 | 1054 | 6.9 | -3.2 | - | - | 4 | - | 4 | Gross Errors and Bias |
| 64548 | 4234 | 59 | 0.6 | 0.0 | - | - | 0 | - | 1 | Bias at end of period |

*ii): Platforms **operational** at the end of the reporting period*

| Identifier | N Obs. | NGE | SD | Bias | B | E | F | T | W | Comments |
|---|---|---|---|---|---|---|---|---|---|---|
| 15501 | 1072 | 201 | 2.1 | -0.6 | - | - | 2 | - | 2 | Gross Errors and Bias |
| 16526 | 1721 | 0 | 1.2 | -0.5 | - | - | 0 | - | 0 | Bias at end of period |
| 21904 | 1912 | 0 | 2.1 | 0.4 | - | - | 2 | - | 0 | Bias at end of period |
| 23904 | 959 | 1 | 1.9 | 1.4 | - | - | 0 | - | 0 | Period |
| 25539 | 653 | 15 | 2.4 | 3.3 | - | - | 2 | - | 1 | Bias |
| 33502 | 609 | 0 | 0.4 | 4.3 | - | - | 0 | - | 3 | Bias |
| 41595 | 3581 | 9 | 0.9 | 0.2 | - | - | 0 | - | 0 | Bias at end of period |
| 43508 | 768 | 768 | --- | --- | - | - | 4 | - | 4 | Gross Errors |
| 43904 | 1649 | 74 | 0.6 | -0.3 | - | - | 0 | - | 1 | Gross Errors |
| 46736 | 714 | 0 | 1.0 | 2.4 | - | - | 0 | - | 1 | Bias at end of period |
| 46969 | 816 | 272 | 2.9 | 3.1 | - | - | 1 | - | 2 | Bias |
| 51527 | 1368 | 1068 | 0.2 | -0.2 | - | - | 5 | - | 5 | Gross Errors |
| 52618 | 1366 | 0 | 1.9 | -1.1 | - | - | 0 | - | 0 | Bias from April |
| 52668 | 448 | 0 | 4.4 | -2.7 | - | - | 3 | - | 0 | Bias |
| 62843 | 1477 | 1095 | 7.5 | -1.2 | - | - | 4 | - | 4 | Gross Errors |

## Table9b: Platforms reporting in SHIP code

| Identifier | N Obs. | NGE | SD | Bias | B | E | F | T | W | Comments |
|---|---|---|---|---|---|---|---|---|---|---|
| CG2960 | 505 | 43 | 2.7 | 1.2 | - | - | 4 | - | 0 | Bias |
| C6FD8 | 243 | 0 | 1.5 | -1.9 | - | - | 1 | - | 1 | Bias |
| C6HS4 * | 150 | 3 | 2.6 | -3.0 | - | - | 1 | - | 2 | Bias |
| C6IZ7 | 99 | 0 | 1.8 | 2.0 | - | - | 0 | - | 0 | Bias |
| C6MS4 * | 104 | 2 | 1.5 | -2.6 | - | - | 0 | - | 0 | Bias |
| C6MX4 | 59 | 0 | 1.3 | 4.2 | - | - | 0 | - | 2 | Bias |
| C6OM7 | 187 | 2 | 2.1 | -1.5 | - | - | 1 | - | 1 | Bias from May |
| C6OQ8 * | 187 | 0 | 1.5 | 4.4 | - | - | 2 | - | 5 | Bias |
| DBBH | 2561 | 5 | 1.4 | 0.2 | - | - | 0 | - | 0 | Bias at end of period |
| ELGN6 * | 114 | 101 | 1.8 | 5.8 | - | - | 0 | - | 0 | Gross Errors |
| ELJL8 | 159 | 59 | 3.5 | 3.8 | - | - | 2 | - | 2 | Bias |
| ELKU8 * | 115 | 1 | 1.2 | 2.8 | - | - | 0 | - | 1 | Bias |
| ELPQ9 | 401 | 0 | 1.0 | 3.7 | - | - | 0 | - | 2 | Bias |
| ELWB8 | 136 | 0 | 1.6 | -2.8 | - | - | 0 | - | 0 | Bias |
| ELWT7 | 3197 | 2 | 1.1 | 0.7 | - | - | 0 | - | 0 | Bias at end of period |
| ELWY3 | 60 | 0 | 0.5 | 3.1 | - | - | 0 | - | 0 | Bias |
| ELXT8 | 193 | 4 | 1.9 | -1.6 | - | - | 0 | - | 1 | Bias at end of period |
| JADY | 69 | 0 | 1.5 | 4.4 | - | - | 0 | - | 0 | Bias |
| KIOH | 183 | 1 | 2.1 | -3.9 | - | - | 2 | - | 1 | Bias from May |
| KRPB * | 309 | 0 | 2.1 | -2.9 | - | - | 1 | - | 1 | Bias |

Continued →

| Identifier | N Obs. | NGE | SD | Bias | B | E | F | T | W | Comments |
|---|---|---|---|---|---|---|---|---|---|---|
| LAHG2 * | 82 | 7 | 2.6 | -2.4 | - | - | 1 | - | 1 | Bias at end of period |
| MVXQ8 | 151 | 0 | 1.3 | -3.6 | - | - | 3 | - | 4 | Bias |
| MWBI9 | 262 | 0 | 2.8 | 0.8 | - | - | 1 | - | 1 | Bias at end of period |
| MZGK7 | 153 | 1 | 2.6 | -1.3 | - | - | 1 | - | 0 | Bias at end of period |
| NLGF * | 102 | 1 | 0.8 | 3.1 | - | - | 0 | - | 0 | Bias |
| OUEX | 417 | 4 | 2.6 | 0.3 | - | - | 2 | - | 1 | Bias at end of period |
| OUGY | 75 | 1 | 2.5 | 2.7 | - | - | 1 | - | 1 | Bias at end of period |
| PCQL | 163 | 0 | 0.9 | -3.2 | - | - | 0 | - | 0 | Bias |
| PDYI * | 135 | 0 | 1.3 | -2.4 | - | - | 0 | - | 0 | Bias |
| PJJU | 218 | 13 | 2.9 | 0.6 | - | - | 0 | - | 0 | Gross Errors and Bias |
| PJOX * | 84 | 1 | 1.4 | -4.1 | - | - | 0 | - | 1 | Bias |
| PPSV | 143 | 0 | 2.1 | -2.2 | - | - | 1 | - | 1 | Bias at end of period |
| P3ZY6 | 89 | 0 | 1.6 | -3.1 | - | - | 1 | - | 0 | Bias |
| TSMS * | 435 | 1 | 1.5 | -3.0 | - | - | 1 | - | 0 | Bias from April |
| UAIS * | 60 | 0 | 1.8 | -4.0 | - | - | 1 | - | 1 | Bias |
| UBAW | 140 | 0 | 3.0 | -5.7 | - | - | 2 | - | 2 | Bias |
| UCUP | 47 | 0 | 2.4 | -3.9 | - | - | 1 | - | 2 | Bias |
| UDWE * | 146 | 0 | 1.7 | -3.5 | - | - | 1 | - | 1 | Bias |
| UFNH | 146 | 36 | 0.8 | 0.4 | - | - | 0 | - | 1 | Gross Errors |
| UGMC | 75 | 0 | 3.5 | 1.5 | - | - | 2 | - | 1 | Bias at end of period |
| UIAI | 105 | 9 | 2.2 | -1.4 | - | - | 0 | - | 1 | Bias at end of period |
| VGDT | 54 | 0 | 3.6 | 3.8 | - | - | 0 | - | 0 | Bias |
| VRRD | 62 | 0 | 1.7 | -3.7 | - | - | 0 | - | 0 | Bias |
| V2PB9 * | 86 | 0 | 1.5 | -3.2 | - | - | 0 | - | 0 | Bias |
| V7AT5 | 182 | 13 | 3.1 | -1.2 | - | - | 1 | - | 1 | Bias |
| V7CN8 | 97 | 0 | 1.2 | 4.2 | - | - | 0 | - | 0 | Bias |
| WCZ938 * | 87 | 0 | 1.7 | 5.8 | - | - | 1 | - | 1 | Bias |
| WYP8657 | 116 | 0 | 2.5 | 4.2 | - | - | 2 | - | 0 | Bias |
| WZJD * | 273 | 0 | 1.2 | -3.3 | - | - | 0 | - | 0 | Bias |
| Y3CH | 3210 | 2 | 1.6 | 1.1 | - | - | 3 | - | 0 | Bias at end of period |
| ZCBJ6 | 43 | 0 | 2.0 | -2.8 | - | - | 0 | - | 0 | Bias |
| 3EBW4 | 47 | 7 | 1.9 | 5.8 | - | - | 2 | - | 2 | Bias |
| 3ECM7 | 628 | 0 | 1.3 | 3.0 | - | - | 0 | - | 1 | Bias |
| 3EST7 | 143 | 0 | 2.6 | -3.3 | - | - | 2 | - | 1 | Bias |
| 3FDV6 | 126 | 1 | 1.7 | 2.0 | - | - | 1 | - | 1 | Bias from May |
| 3FPA6 | 66 | 0 | 0.3 | 7.9 | - | - | 0 | - | 1 | Bias |
| 413FMM * | 140 | 2 | 1.6 | -3.4 | - | - | 0 | - | 0 | Bias |
| 44008 | 4172 | 0 | 1.2 | -1.0 | - | - | 0 | - | 1 | Bias at end of period |
| 45007 | 782 | 0 | 1.5 | 0.0 | - | - | 0 | - | 0 | Bias at end of period |
| 45149 | 1515 | 0 | 2.3 | -1.3 | - | - | 1 | - | 1 | Bias at end of period |
| 45151 | 666 | 137 | 1.9 | 5.5 | - | - | 2 | - | 0 | Bias |
| 45154 | 841 | 28 | 2.2 | 5.6 | - | - | 2 | - | 1 | Bias |

## TABLE 10: LIST OF PLATFORMS REPORTING IN SHIP CODE NOT APPEARING IN TABLE 9 BUT LISTED AS SUSPECT OVER THE PERIOD JULY TO DECEMBER 2000.

| | | |
|---|---|---|
| Column | 1 | Call sign or identifier |
| Column | 2 | Number of sea-surface temperature observations available for monitoring over the 6-month period, including any observations with gross errors. |
| Column | 3 | Number of sea surface temperature observations differing by more than 10 °C from the background (gross error). |
| Column | 4 | Standard deviation of observation-minus-background differences excluding cases of gross error. |
| Column | 5 | Mean of observation-minus-background differences excluding cases of gross error. |
| Column | 6 | Comments on quality of sea surface temperature observations. |

*Notes*: 1. Units are °C

| Identifier | N Obs. | NGE | SD | Bias | Comments |
|---|---|---|---|---|---|
| CGDS | 409 | 2 | 2.9 | 4.3 | Bias reduced |
| DBBC | 3359 | 0 | 1.4 | 0.5 | GE and Bias reduced |
| DQRA | 0 | --- | --- | --- | No reports |
| GQUK | 140 | 1 | 2.3 | -0.8 | Bias reduced |
| H3AK | 356 | 0 | 1.0 | -0.8 | Bias reduced |
| JKHH | 637 | 0 | 1.8 | 1.5 | Bias reduced |
| KHRK | 259 | 0 | 1.8 | 1.9 | Bias reduced |
| LAVW4 | 220 | 3 | 1.8 | -0.4 | Bias reduced |
| PCBL | 174 | 0 | 1.9 | 1.9 | Bias reduced |
| PDYX | 264 | 0 | 1.6 | -1.4 | Bias reduced |
| PPSO | 207 | 0 | 1.9 | 0.8 | Bias reduced |
| SGIX | 54 | 0 | 2.2 | 2.5 | Bias rduced |
| S6JP | 125 | 13 | 1.6 | 0.5 | Gross Errors reduced |
| S6TS | 269 | 12 | 2.5 | -3.0 | Bias reduced |
| UBHT | 1 | 0 | 0.0 | -0.9 | Less than 40 reports |
| UBLX | 103 | 0 | 1.8 | -0.8 | Bias reduced |
| UCOQ | 258 | 0 | 1.7 | -1.7 | Bias reduced |
| WGJF | 124 | 2 | 1.8 | -1.6 | Bias reduced |
| YJZC5 | 195 | 0 | 2.9 | -2.3 | Bias reduced |
| 12501 | 0 | --- | --- | --- | No reports |
| 17555 | 0 | --- | --- | --- | No reports |
| 21908 | 0 | --- | --- | --- | No reports |
| 22912 | 0 | --- | --- | --- | No reports |
| 23589 | 0 | --- | --- | --- | No reports |
| 3EJO6 | 84 | 0 | 1.2 | 0.0 | Bias reduced |

Continued →

| Identifier | N Obs. | NGE | SD | Bias | Comments |
|---|---|---|---|---|---|
| 32828 | 0 | --- | --- | --- | No reports |
| 41008 | 4186 | 0 | 2.3 | -2.0 | Bias reduced |
| 41529 | 0 | --- | --- | --- | No reports |
| 42007 | 4177 | 2 | 2.8 | -1.8 | Bias reduced |
| 42035 | 4183 | 0 | 2.3 | -1.2 | Bias reduced |
| | | | | | |
| 46541 | 0 | --- | --- | --- | No reports |
| 46922 | 0 | --- | --- | --- | No reports |
| 51801 | 0 | --- | --- | --- | No reports |
| 51813 | 0 | --- | --- | --- | No reports |
| 51828 | 0 | --- | --- | --- | No reports |
| | | | | | |
| 55038 | 0 | --- | --- | --- | No reports |
| 64571 | 0 | --- | --- | --- | No reports |
| 71571 | 0 | --- | --- | --- | No reports |
| 8PNI | 0 | --- | --- | --- | No reports |

Figure 1: Number of observations of pressure received at Bracknell on the GTS for each of the six-month periods covered by the WMO reports on the quality of marine surface observations

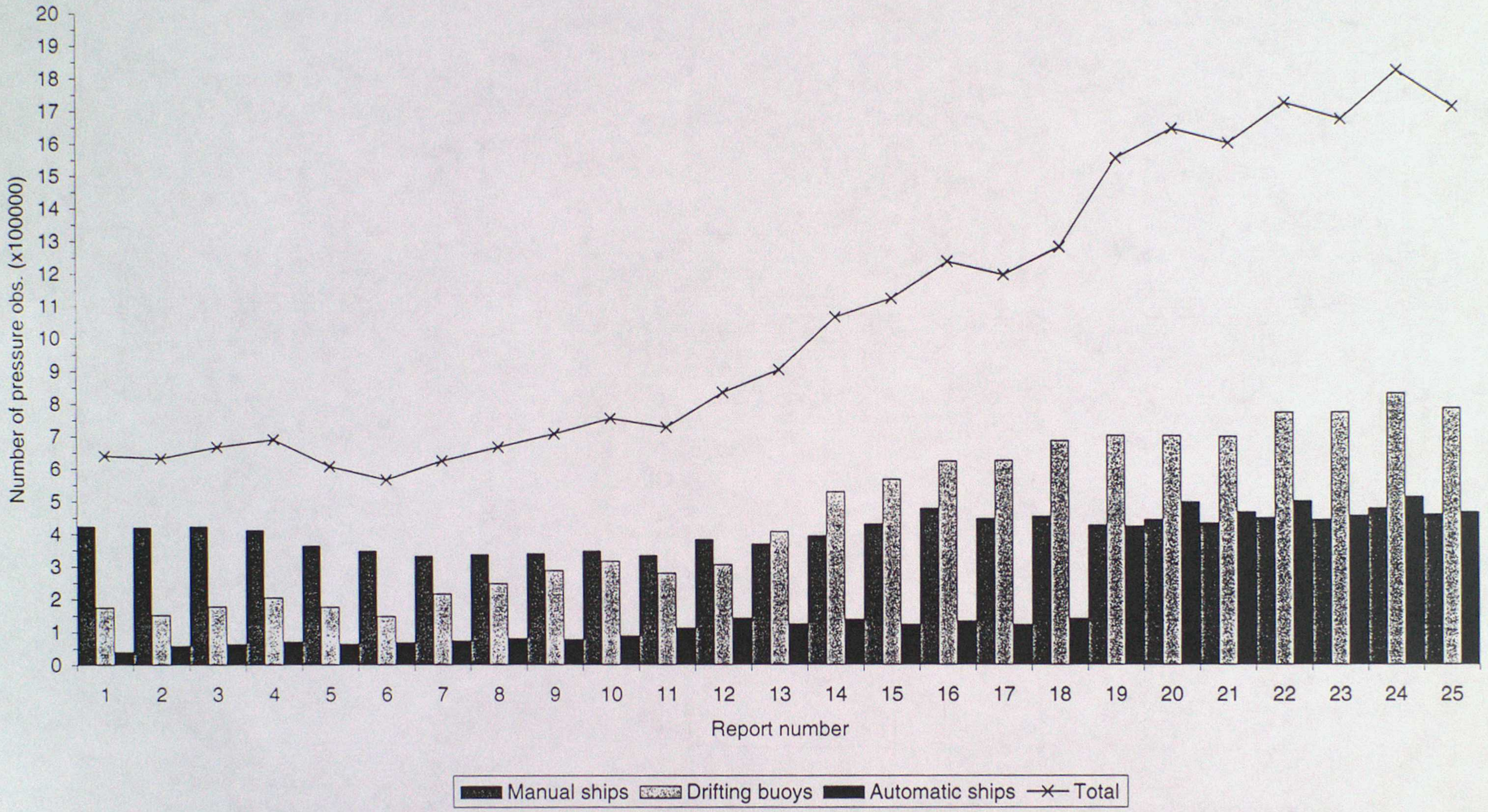
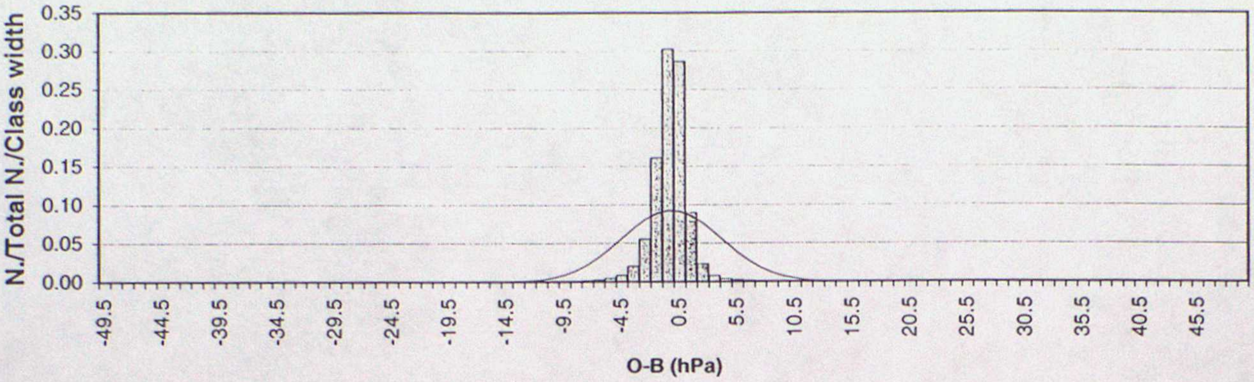
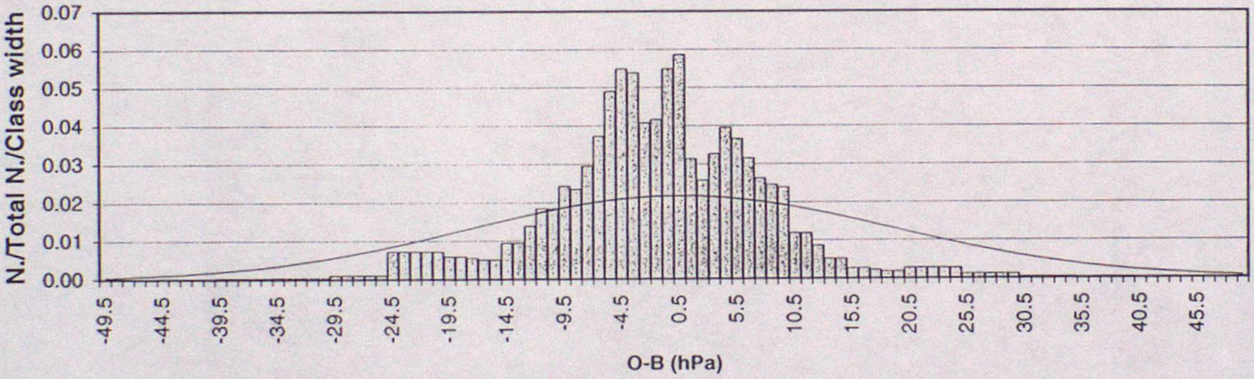


Figure 2a: Distribution of ship O-B pressure (hPa)
Period of data: Jan-June 2001 Data used: All observations



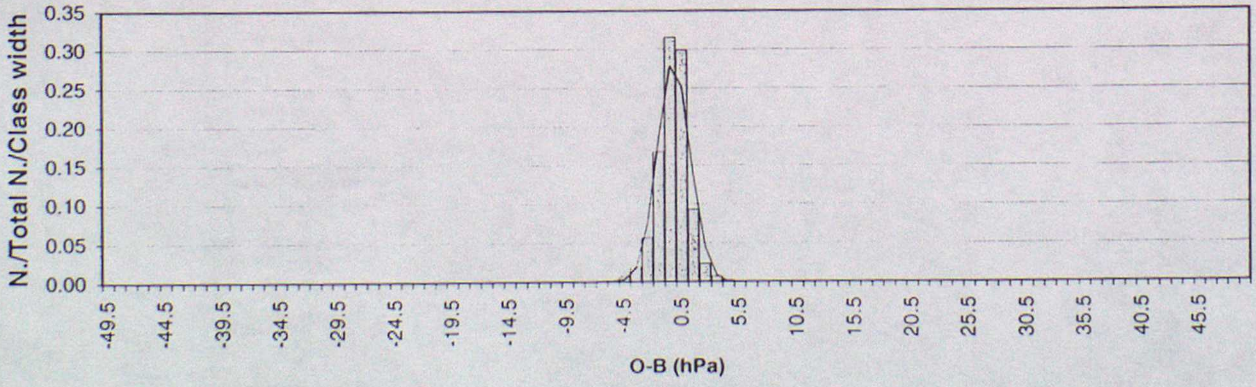
Mean O-B = -0.2 SD O-B = 4.3

Figure 2b: Distribution of ship O-B pressure (hPa)
Period of data: Jan-June 2001 Data used: Flagged observations



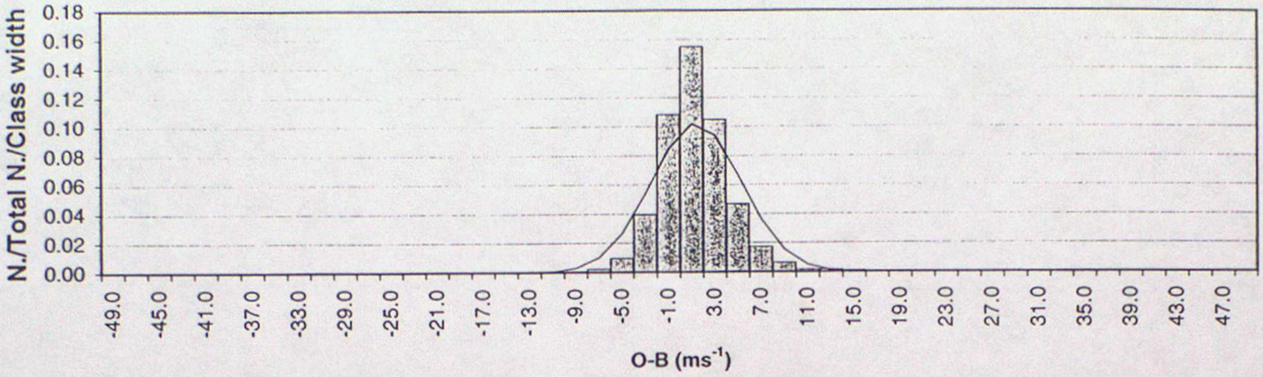
Mean O-B = 0.6 SD O-B = 18.4

Figure 2c: Distribution of ship O-B pressure (hPa)
Period of data: Jan-June 2001 Data used: Unflagged observations



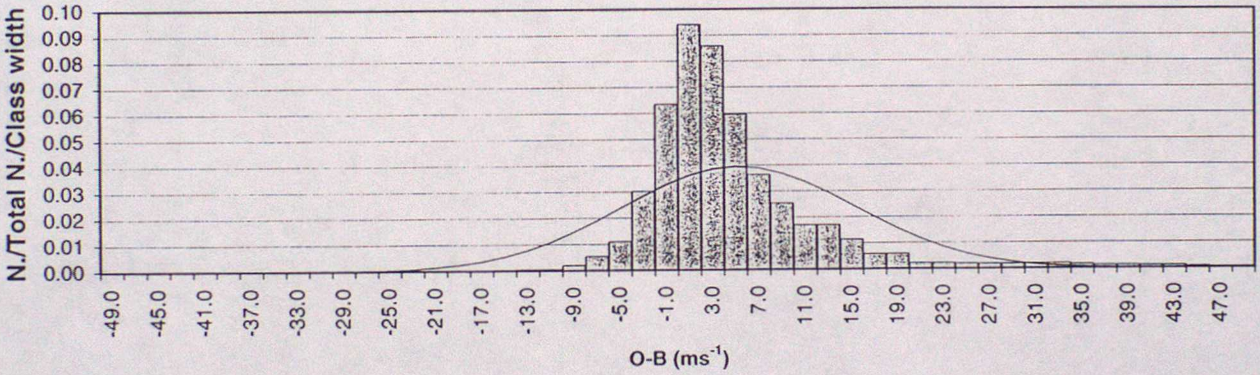
Mean O-B = -0.2 SD O-B = 1.4

Figure 2d: Distribution of ship O-B wind speed (ms$^{-1}$)
Period of data: Jan-June 2001 Data used: All observations



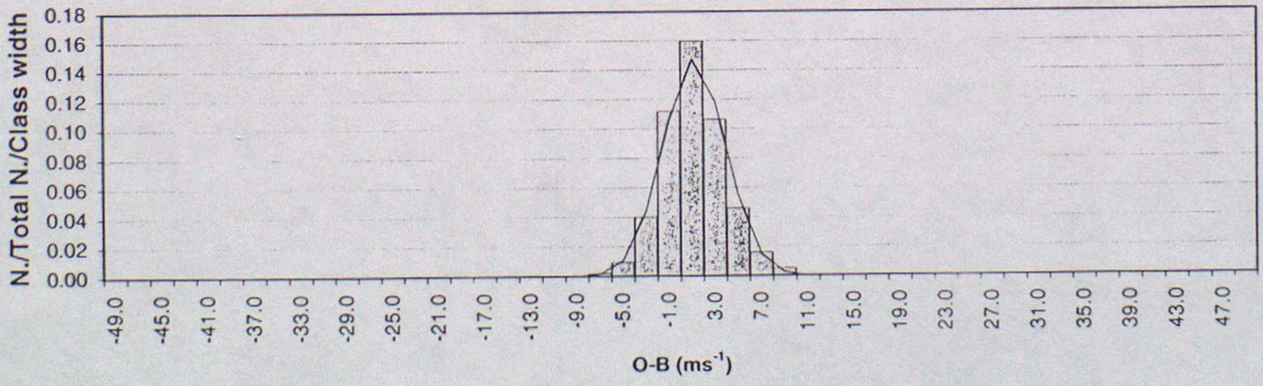
Mean O-B = 1.4 SD O-B = 3.9

Figure 2e: Distribution of ship O-B wind speed (ms$^{-1}$)
Period of data: Jan-June 2001 Data used: Flagged observations



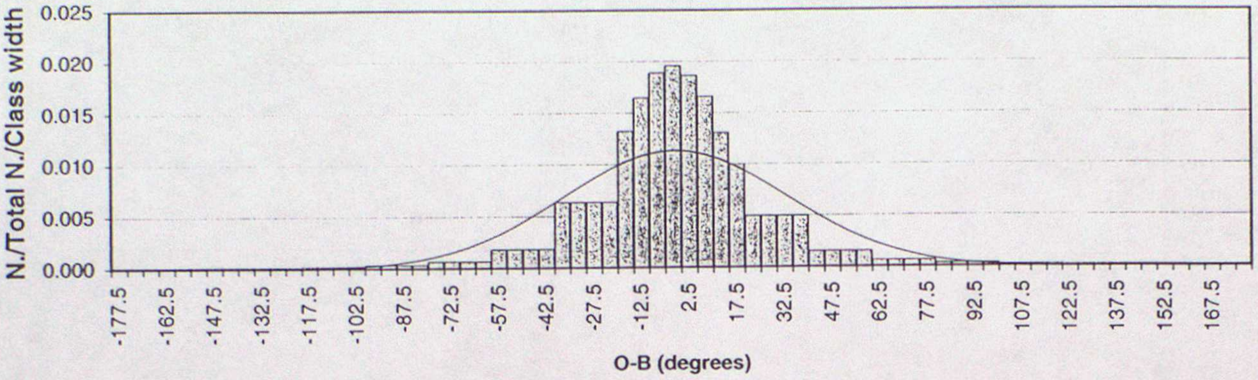
Mean O-B = 5.2 SD O-B = 10.1

Figure 2f: Distribution of ship O-B wind speed (ms$^{-1}$)
Period of data: Jan-June 2001 Data used: Unflagged observations



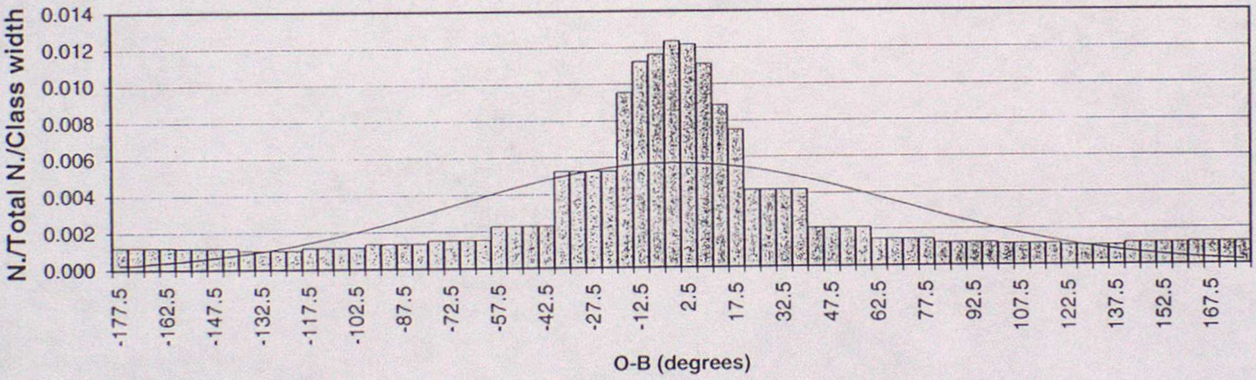
Mean O-B = 1.2 SD O-B = 2.7

Figure 2g: Distribution of ship O-B wind direction (degrees)
Period of data: Jan-June 2001 Data used: All observations



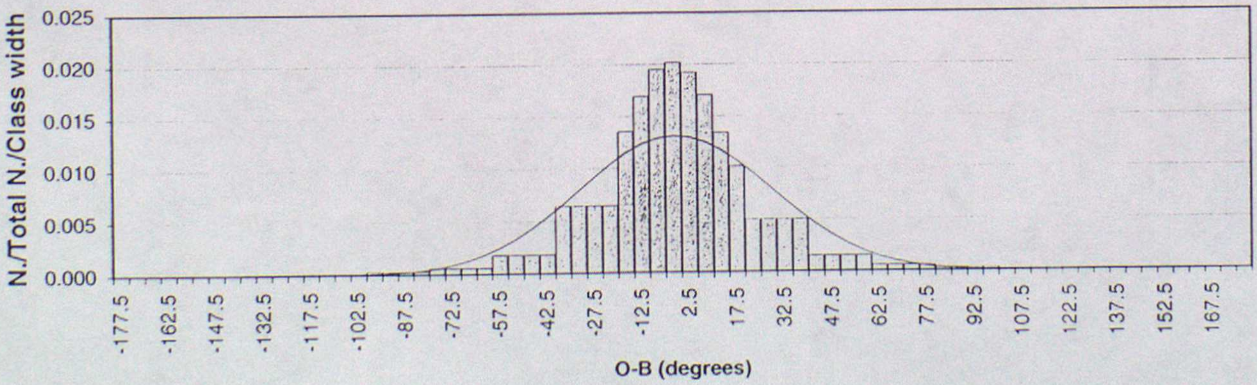
Mean O-B = -1.9 SD O-B = 35.2

Figure 2h: Distribution of ship O-B wind direction (degrees)
Period of data: Jan-June 2001 Data used: Flagged observations



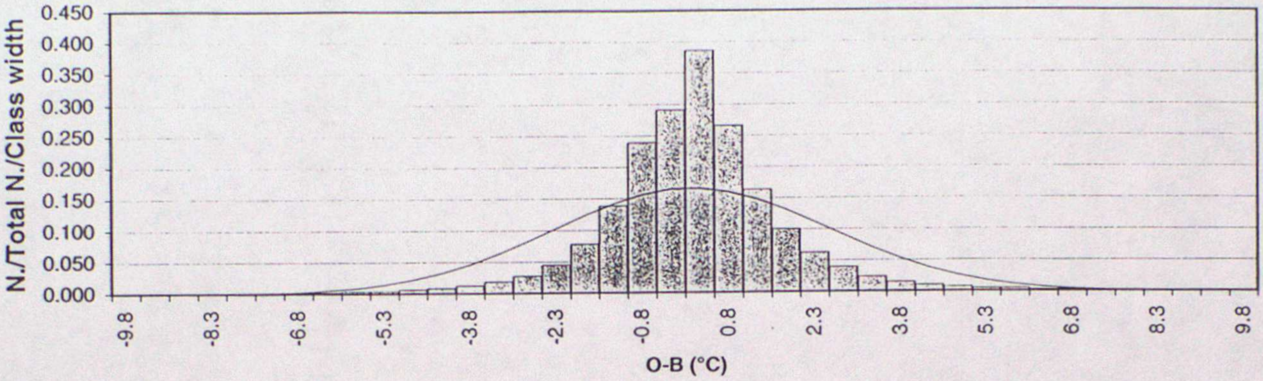
Mean O-B = -1.5 SD O-B = 70.2

Figure 2i: Distribution of ship O-B wind direction (degrees)
Period of data: Jan-June 2001 Data used: Unflagged observations



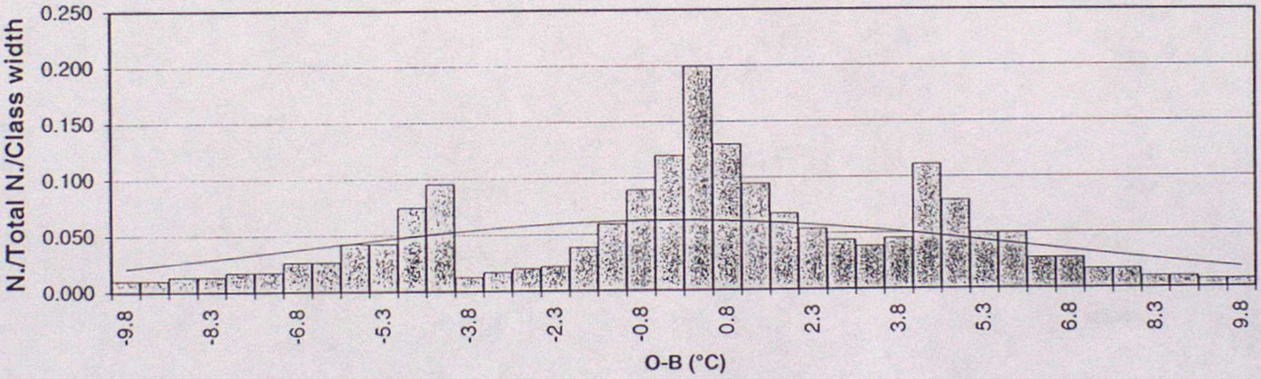
Mean O-B = -1.9 SD O-B = 30.4

Figure 2j: Distribution of ship O-B SST (°C)
Period of data: Jan-June 2001 Data used: All observations



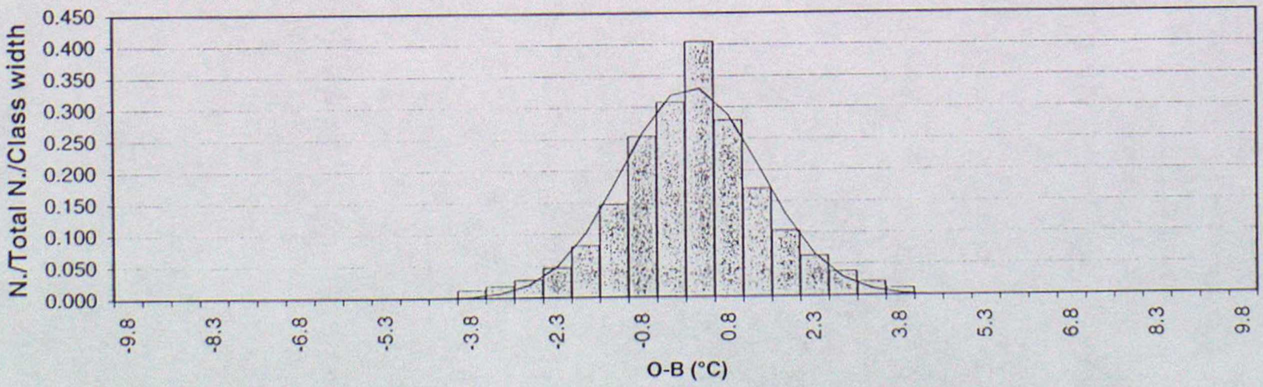
Mean O-B = 0.1 SD O-B = 2.4

Figure 2k: Distribution of ship O-B SST (°C)
Period of data: Jan-June 2001 Data used: Flagged observations



Mean O-B = -0.3 SD O-B = 6.4

Figure 2l: Distribution of ship O-B SST (°C)
Period of data: Jan-June 2001 Data used: Unflagged observations



Mean O-B = 0.1 SD O-B = 1.2

Figure 3: Bias of Ship O-B Pressure (hPa). Date:- January - June 2001

Only observations passing quality control used in statistics

Contours drawn to 10 degree boxes, if the number of observations is greater than 10

Shaded areas have a bias of magnitude greater than 0.5 hPa

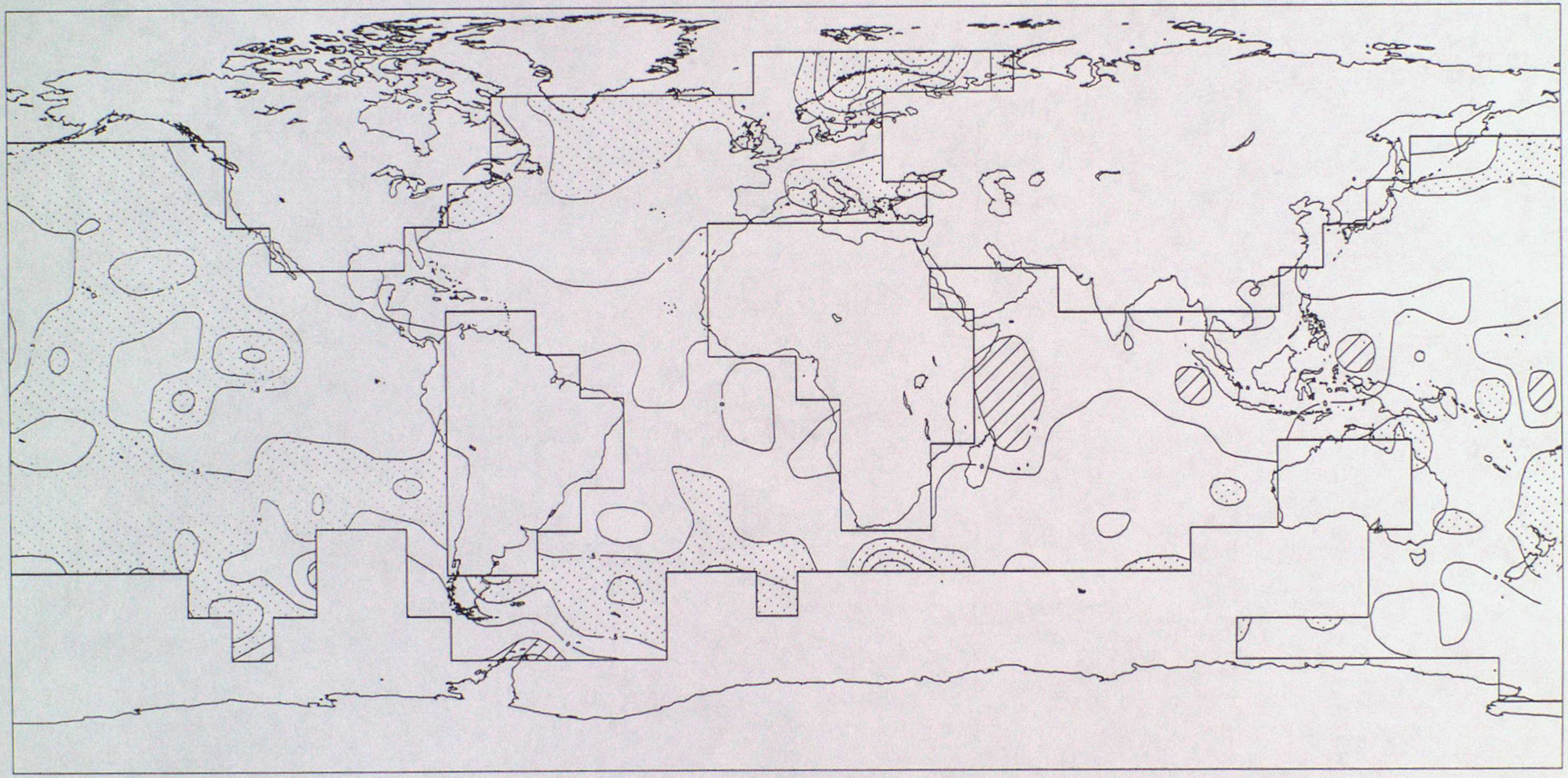


Figure 4: Standard Deviation of Ship O-B Pressure (hPa). Date:- January - June 2001
Only Observations passing quality control used in statistics
Contours drawn to 10 degree boxes, if the number of observations is greater than 10
Shaded areas have a standard deviation of greater than 2.0 hPa

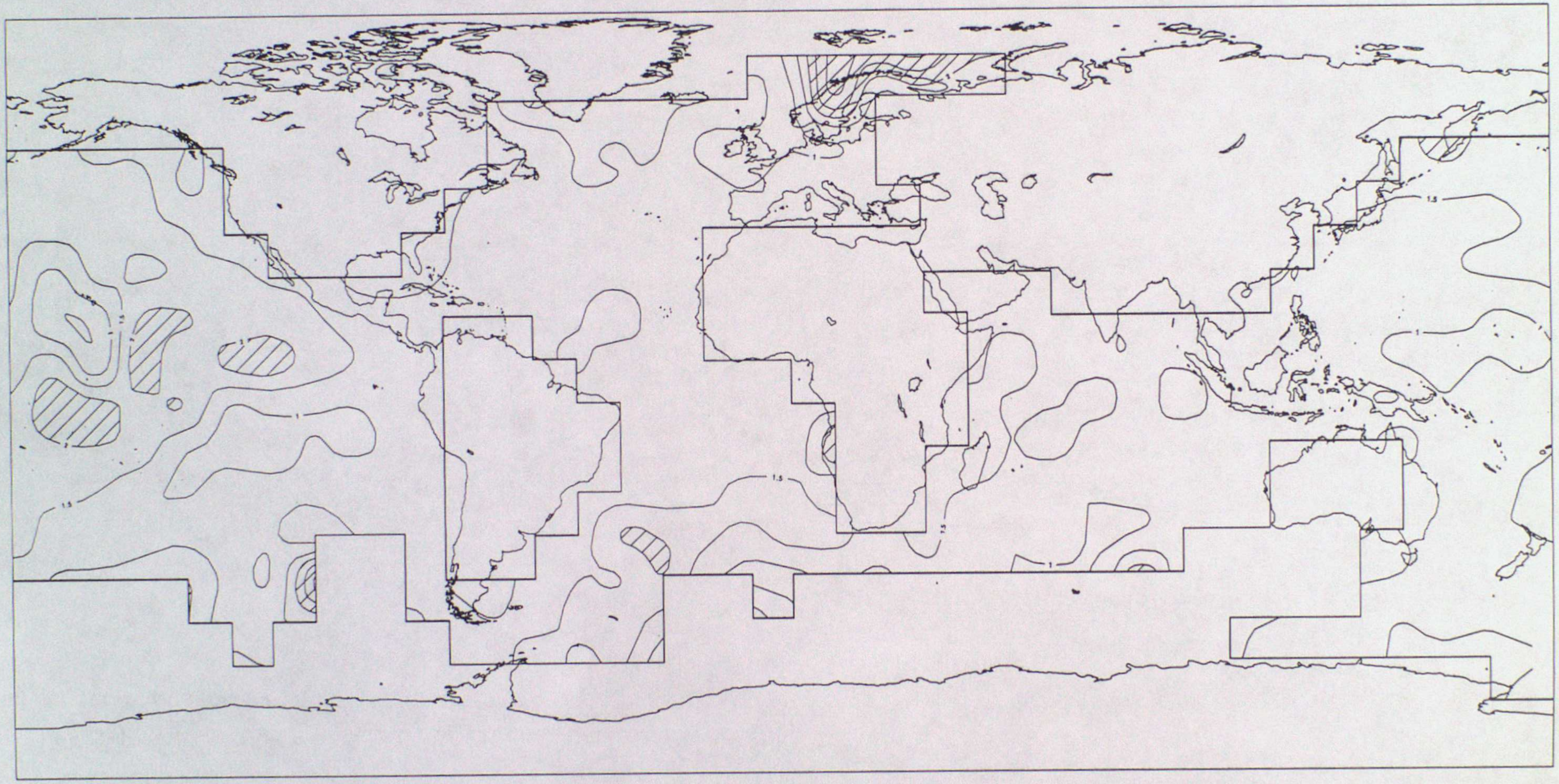


Figure 5:

Plot of the Number of Ship Pressure Observations. Date:- January - June 2001

Only observations passing quality control included

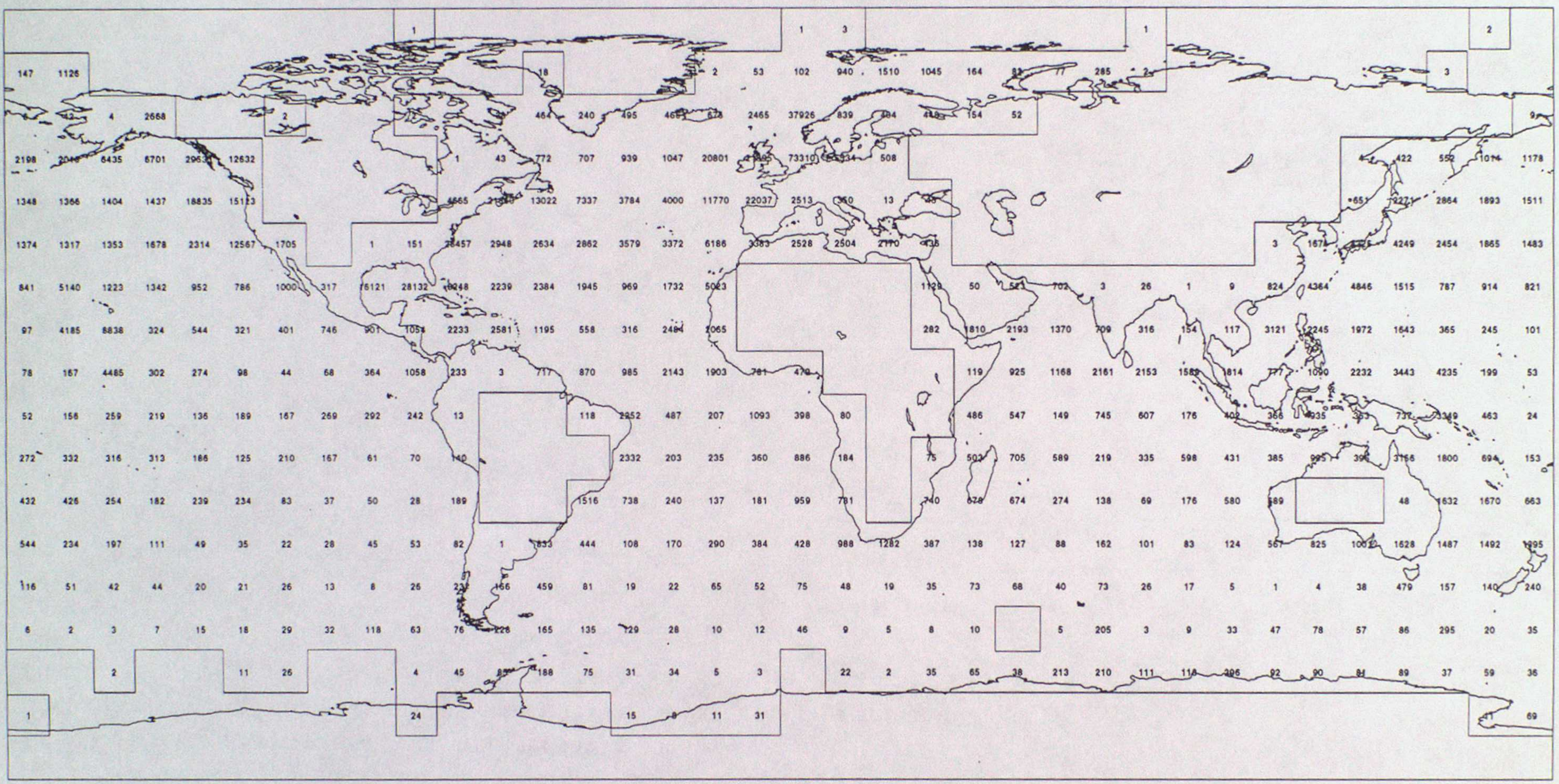

1 1 3 1 2
147 1126 18 2 53 102 940 1510 1045 164 83 77 285 2 3
42 4 2668 2 464 240 495 465 678 2465 37926 839 404 418 154 52 9
2198 2046 6435 6701 2963 12632 1 43 772 707 939 1047 20801 4995 73310 65534 508 422 552 1014 1178
1348 1366 1404 1437 18835 15123 4665 21540 13022 7337 3784 4000 11770 22037 2513 350 13 48 651 9271 2864 1893 1511
1374 1317 1353 1678 2314 12567 1705 1 151 28457 2948 2634 2862 3579 3372 6186 3383 2528 2504 2170 435 3 1674 4249 2454 1865 1483
841 5140 1223 1342 952 786 1000 317 15121 28132 10248 2239 2384 1945 969 1732 5023 1129 50 521 702 3 26 1 9 824 4364 4846 1515 787 914 821
97 4185 8838 324 544 321 401 746 901 1054 2233 2581 1195 558 316 2484 2065 282 1810 2193 1370 709 316 154 117 3121 2245 1972 1643 365 245 101
78 167 4485 302 274 98 44 68 364 1058 233 3 717 870 985 2143 1903 781 470 119 925 1168 2161 2153 1589 1814 777 1090 2232 3443 4235 199 53
52 156 259 219 136 189 167 269 292 242 13 118 2252 487 207 1093 398 80 486 547 149 745 607 176 402 366 1935 353 737 3349 463 24
272 332 316 313 186 125 210 167 61 70 140 2332 203 235 360 886 184 75 503 705 589 219 335 598 431 385 995 396 3166 1800 694 153
432 426 254 182 239 234 83 37 50 28 189 1516 738 240 137 181 959 781 740 678 674 274 138 69 176 580 589 48 1632 1670 663
544 234 197 111 49 35 22 28 45 53 82 1 1833 444 108 170 290 384 428 988 1282 387 138 127 88 162 101 83 124 567 825 1002 1628 1487 1492 1995
116 51 42 44 20 21 26 13 8 26 232 166 459 81 19 22 65 52 75 48 19 35 73 68 40 73 26 17 5 1 4 38 479 157 140 240
6 2 3 7 15 18 29 32 118 63 76 228 165 135 129 28 10 12 46 9 5 8 10 5 205 3 9 33 47 78 57 86 295 20 35
2 11 26 4 45 85 188 75 31 34 5 3 22 2 35 65 38 213 210 111 116 206 92 90 84 89 37 59 36
1 24 15 8 11 31 41 69

Figure 6: Bias of Ship O-B Wind Speed (ms-1).  Date:- January - June  2001

Only observations passing quality control used in statistics

Contours drawn to 10 degree boxes, if the number of observations is greater than 10

Shaded areas have a bias of magnitude greater than 2.0 ms-1

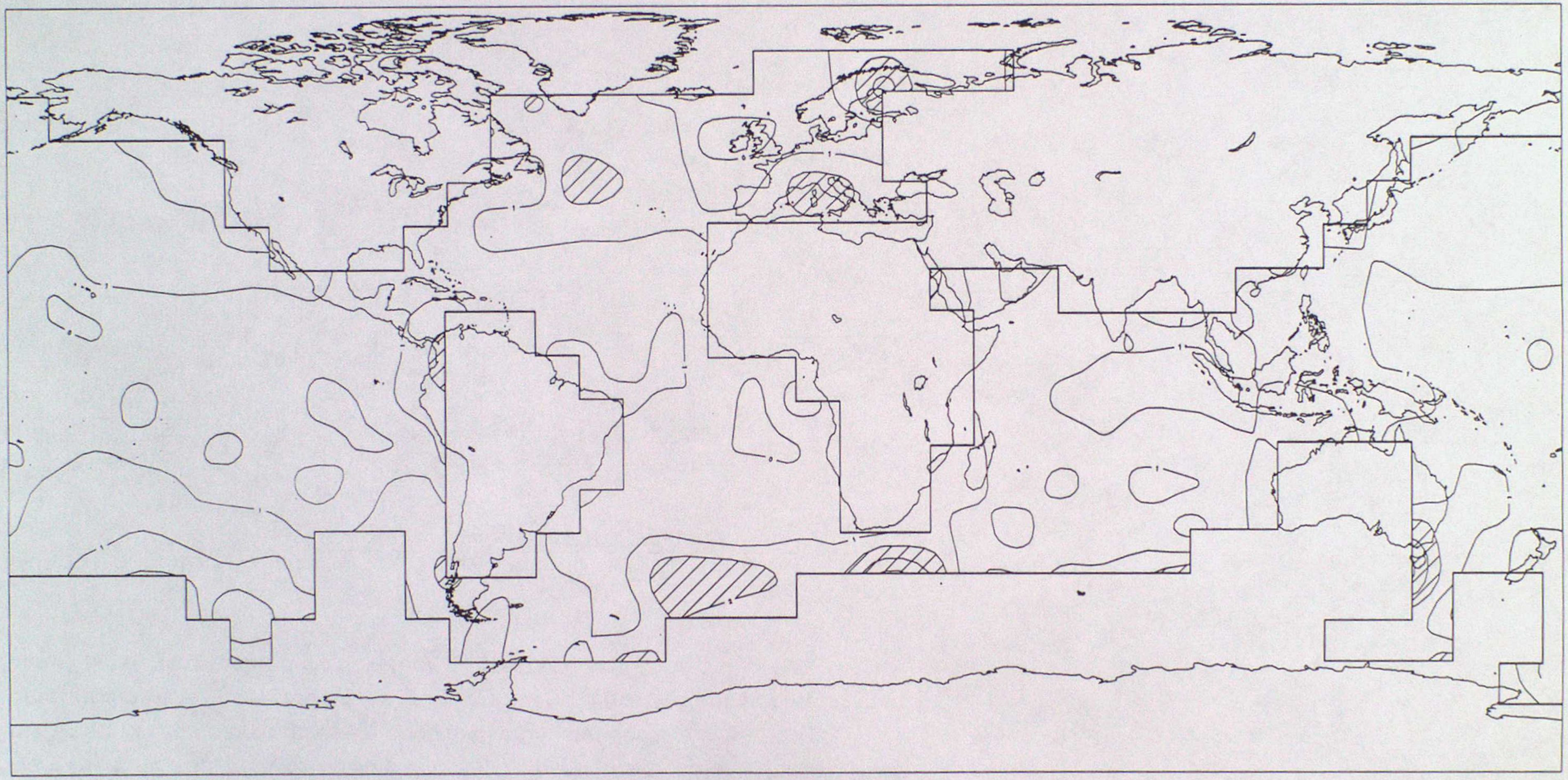


Figure 7: Standard Deviation of Ship O-B Wind Speed (ms-1). Date:- January - June 2001
Only Observations passing quality control used in statistics
Contours drawn to 10 degree boxes, if the number of observations is greater than 10
Shaded areas have a standard deviation of greater than 4.0 ms-1

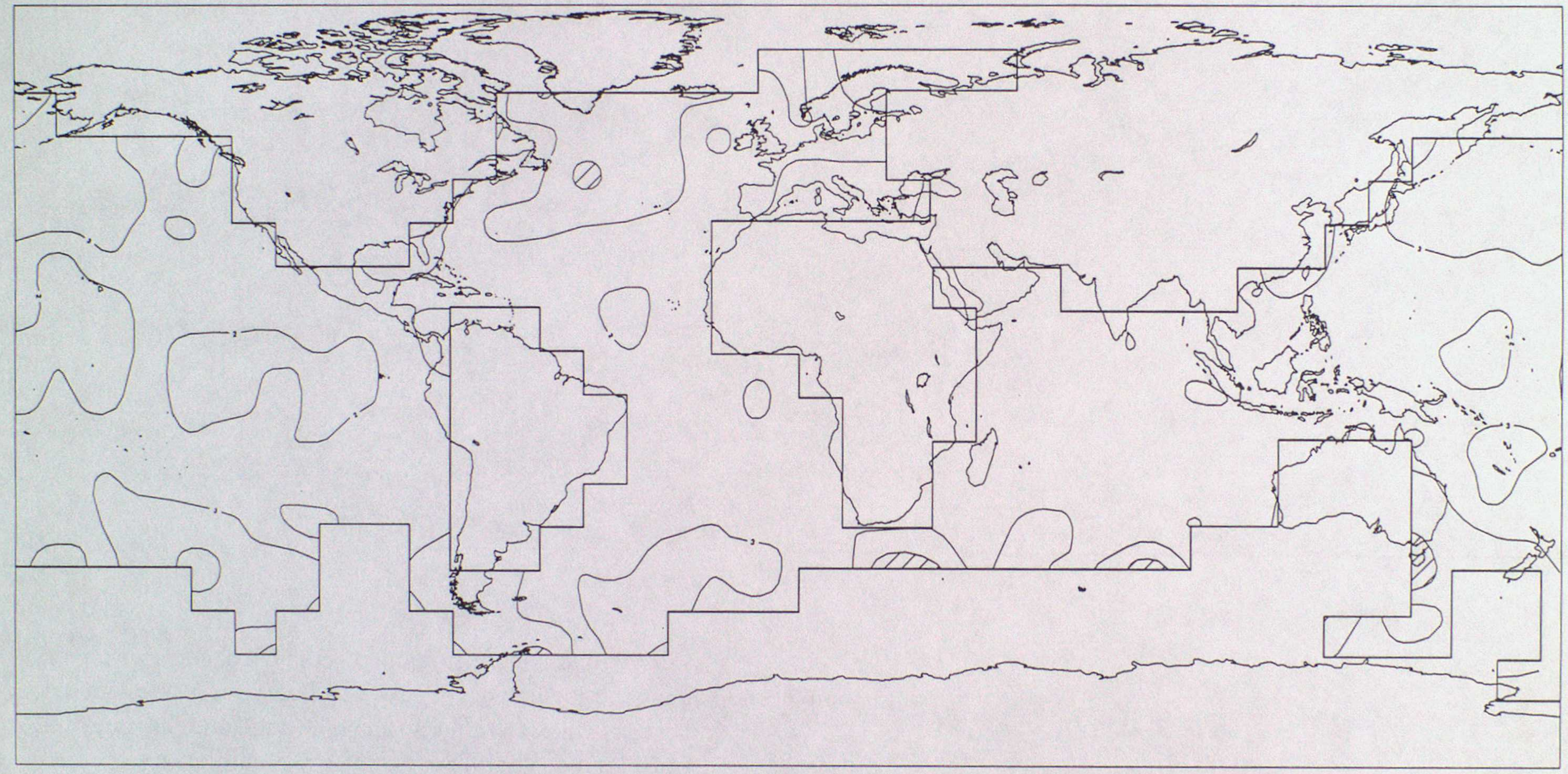


Figure 8:
Plot of the Number of Ship Wind Speed Observations.  Date:- January - June  2001
Only observations passing quality control included

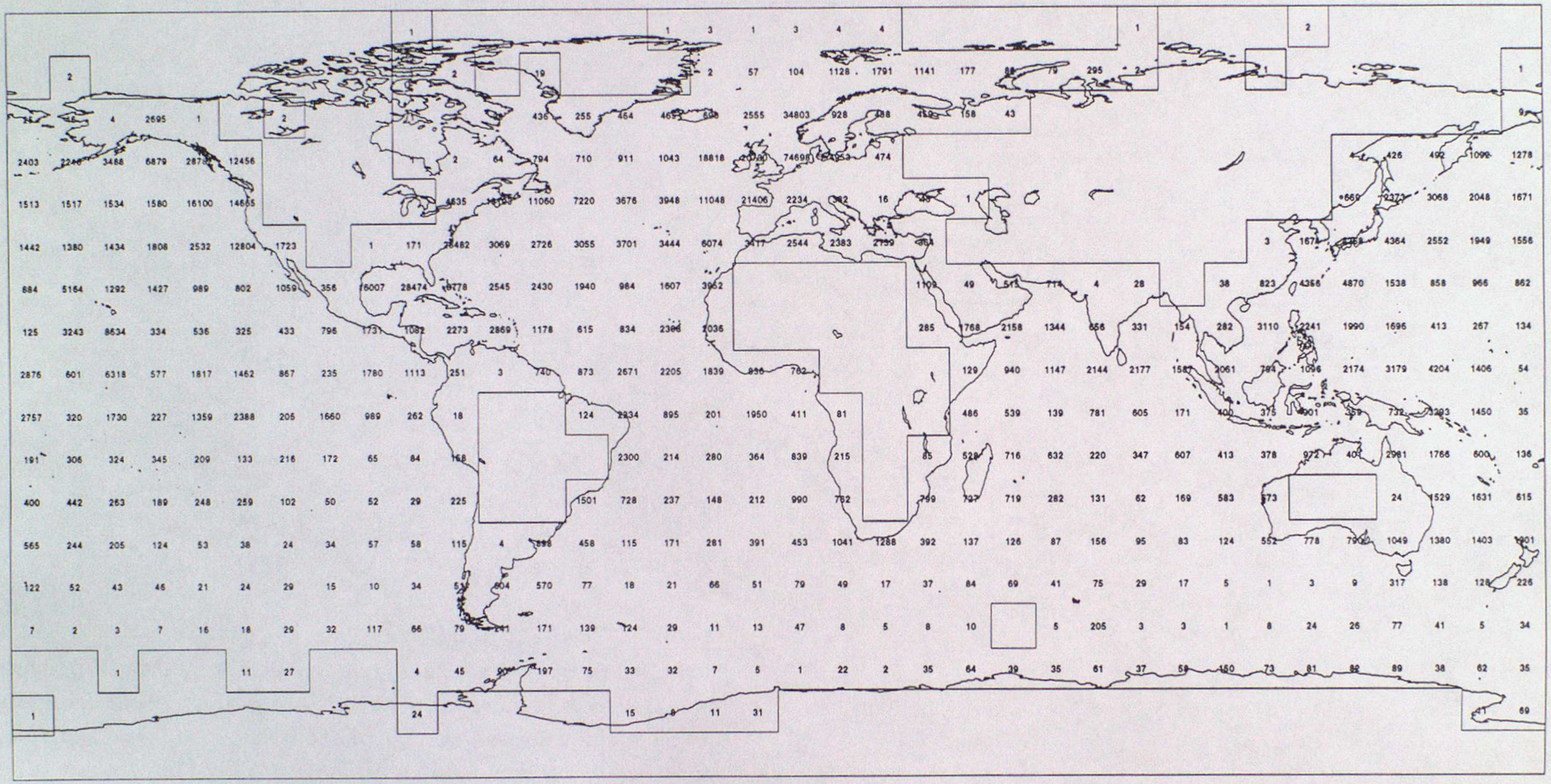

1 1 3 1 3 4 4 1 2
2 2 19 2 57 104 1128 1791 1141 177 88 79 295 2 1 1
4 2695 1 2 436 255 464 469 698 2555 34803 928 488 459 158 43 9
2403 2246 3488 6879 2878 12456 2 64 794 710 911 1043 18818 74698 474 4 426 492 1099 1278
1513 1517 1534 1580 16100 14665 4635 11060 7220 3676 3948 11048 21406 2234 382 16 1 669 2373 3068 2048 1671
1442 1380 1434 1808 2532 12804 1723 1 171 28482 3069 2726 3055 3701 3444 6074 3417 2544 2383 2139 3 1674 4364 2552 1949 1556
884 5164 1292 1427 989 802 1059 356 16007 28474 10778 2545 2430 1940 984 1607 3952 1109 49 515 714 4 28 38 823 4356 4870 1538 858 966 862
125 3243 8634 334 536 325 433 796 1731 1082 2273 2869 1178 615 834 2386 2036 285 1768 2158 1344 656 331 154 282 3110 2241 1990 1696 413 267 134
2876 601 6318 577 1817 1462 867 235 1780 1113 251 3 740 873 2671 2205 1839 836 762 129 940 1147 2144 2177 1587 2061 784 1096 2174 3179 4204 1406 54
2757 320 1730 227 1359 2388 205 1660 989 262 18 124 2934 895 201 1950 411 81 486 539 139 781 605 171 400 375 4901 359 732 3293 1450 35
191 306 324 345 209 133 216 172 65 84 158 2300 214 280 364 839 215 85 528 716 632 220 347 607 413 378 972 401 2981 1766 600 136
400 442 263 189 248 259 102 50 52 29 225 1501 728 237 148 212 990 762 799 727 719 282 131 62 169 583 573 24 1529 1631 615
565 244 205 124 53 38 24 34 57 58 115 4 898 458 115 171 281 391 453 1041 1288 392 137 126 87 156 95 83 124 552 778 7902 1049 1380 1403 1901
122 52 43 46 21 24 29 15 10 34 532 604 570 77 18 21 66 51 79 49 17 37 84 69 41 75 29 17 5 1 3 9 317 138 128 226
7 2 3 7 16 18 29 32 117 66 79 241 171 139 124 29 11 13 47 8 5 8 10 5 205 3 3 1 8 24 26 77 41 5 34
1 11 27 4 45 90 197 75 33 32 7 5 1 22 2 35 64 39 35 61 37 58 150 73 81 82 89 38 62 35
1 24 15 8 11 31 41 69

Figure 9: Bias of Ship O-B Wind Direction (degrees). Date:- January - June 2001

Only observations passing quality control used in statistics

Contours drawn to 10 degree boxes, if the number of observations is greater than 10

Shaded areas have a bias of magnitude greater than 10 degrees

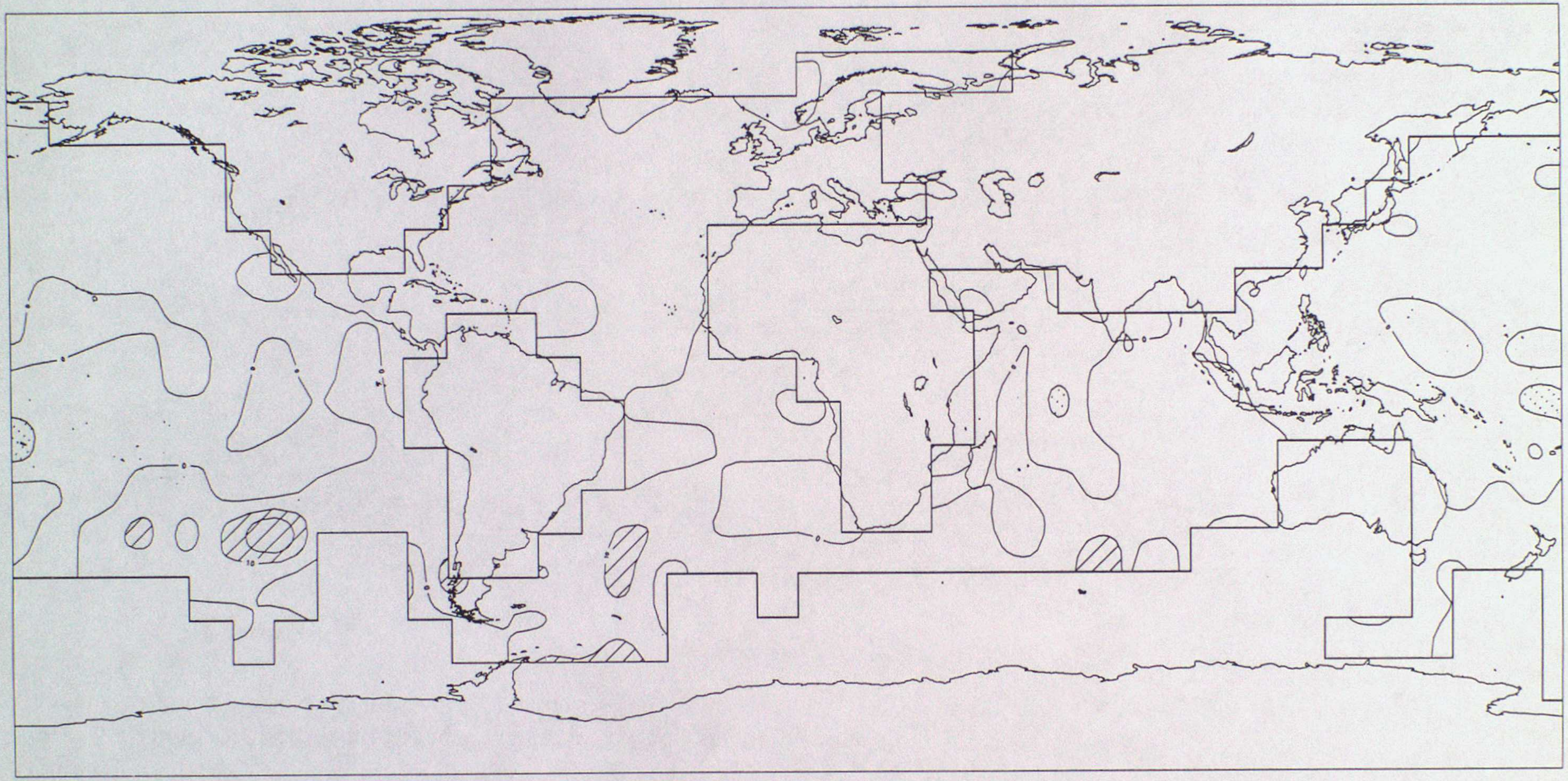


Figure 10: Standard Deviation of Ship O-B Wind Direction (degrees). Date:- January - June 2001

Only Observations passing quality control used in statistics

Contours drawn to 10 degree boxes, if the number of observations is greater than 10

Shaded areas have a standard deviation of greater than 40 degrees

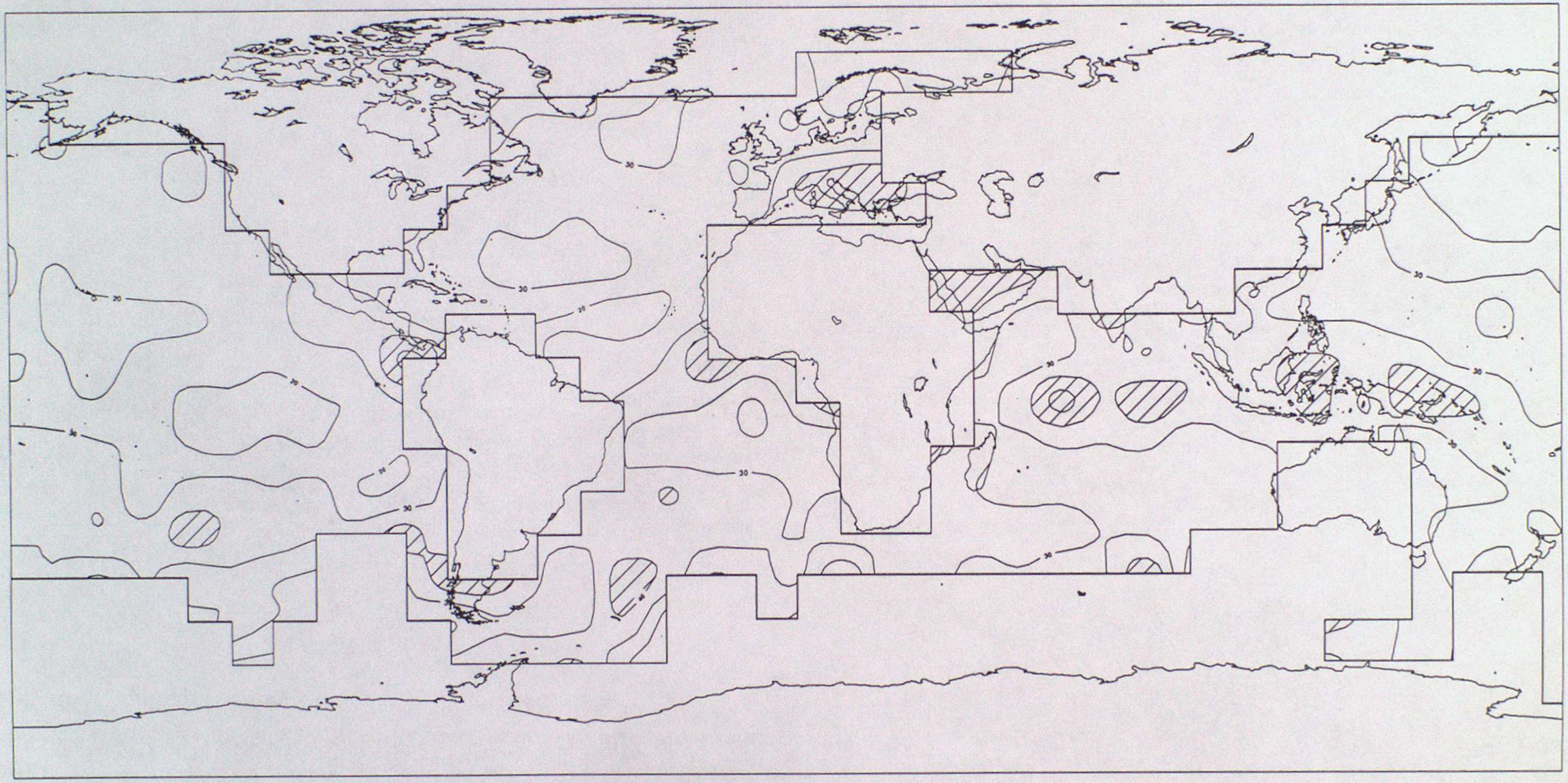
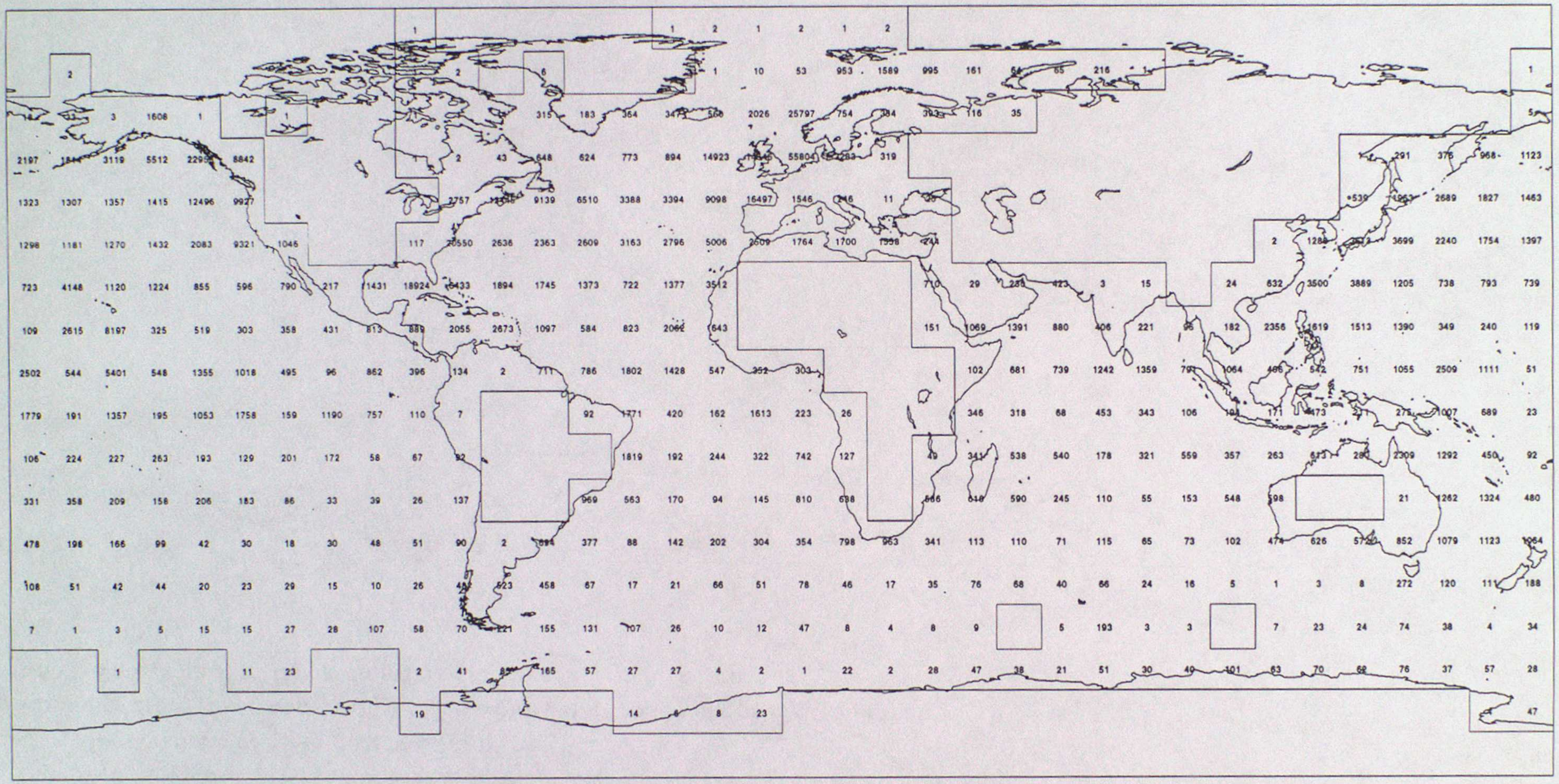


Figure 11:

Plot of the Number of Ship Wind Direction Observations. Date:- January - June 2001

Only observations passing quality control included



1 1 2 1 2 1 2
2 2 6 1 10 53 953 1589 995 161 64 65 216 1 1
3 1608 1 1 315 183 364 347 566 2026 25797 754 384 393 116 35 5
2197 1844 3119 5512 2295 8842 1 2 43 648 624 773 894 14923 19545 55804 4283 319 1 291 376 968 1123
1323 1307 1357 1415 12496 9927 2757 13046 9139 6510 3388 3394 9098 16497 1546 246 11 26 539 11963 2689 1827 1463
1298 1181 1270 1432 2083 9321 1046 117 20550 2636 2363 2609 3163 2796 5006 2609 1764 1700 1398 244 2 1288 2573 3699 2240 1754 1397
723 4148 1120 1224 855 596 790 217 1431 18924 6433 1894 1745 1373 722 1377 3512 710 29 235 423 3 15 24 632 3500 3889 1205 738 793 739
109 2615 8197 325 519 303 358 431 813 889 2055 2673 1097 584 823 2062 1643 151 1069 1391 880 406 221 95 182 2356 1619 1513 1390 349 240 119
2502 544 5401 548 1355 1018 495 96 862 396 134 2 711 786 1802 1428 547 352 303 102 681 739 1242 1359 791 1064 486 542 751 1055 2509 1111 51
1779 191 1357 195 1053 1758 159 1190 757 110 7 92 1771 420 162 1613 223 26 346 318 68 453 343 106 101 171 473 271 275 1007 689 23
106 224 227 263 193 129 201 172 58 67 92 1819 192 244 322 742 127 49 341 538 540 178 321 559 357 263 613 280 2309 1292 450 92
331 358 209 158 206 183 86 33 39 26 137 969 563 170 94 145 810 638 666 618 590 245 110 55 153 548 598 21 1262 1324 480
478 198 166 99 42 30 18 30 48 51 90 2 694 377 88 142 202 304 354 798 963 341 113 110 71 115 65 73 102 474 626 5720 852 1079 1123 1064
108 51 42 44 20 23 29 15 10 26 482 523 458 67 17 21 66 51 78 46 17 35 76 68 40 66 24 16 5 1 3 8 272 120 111 188
7 1 3 5 15 15 27 28 107 58 70 221 155 131 107 26 10 12 47 8 4 8 9 5 193 3 3 7 23 24 74 38 4 34
1 11 23 2 41 85 165 57 27 27 4 2 1 22 2 28 47 38 21 51 30 49 101 63 70 68 76 37 57 28
19 14 6 8 23 47

Figure 12: Bias of Ship O-B SST (degrees C). Date:- January - June 2001
Only observations passing quality control used in statistics
Contours drawn to 10 degree boxes, if the number of observations is greater than 10
Shaded areas have a bias of magnitude greater than 1.0 degrees C

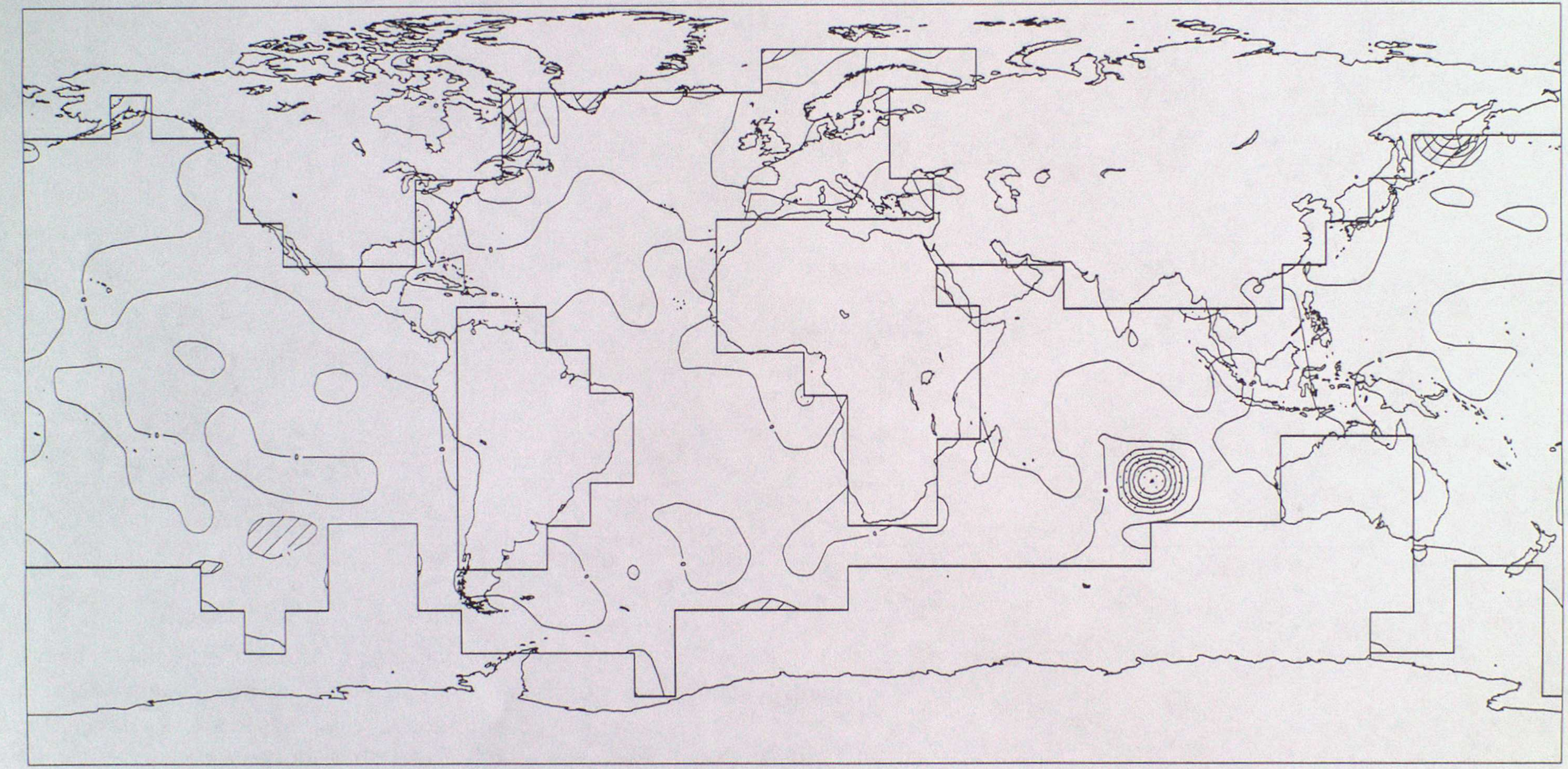
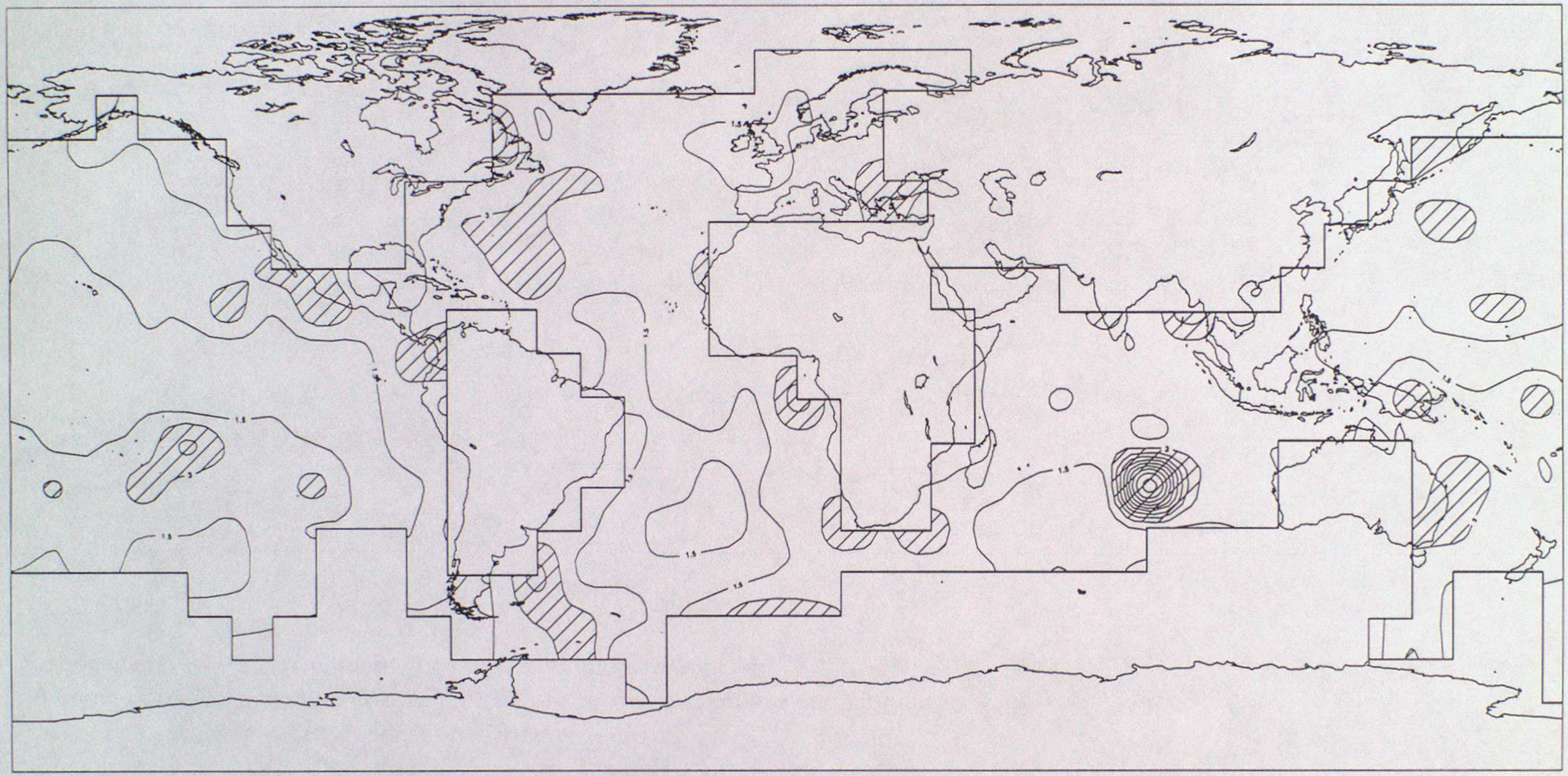


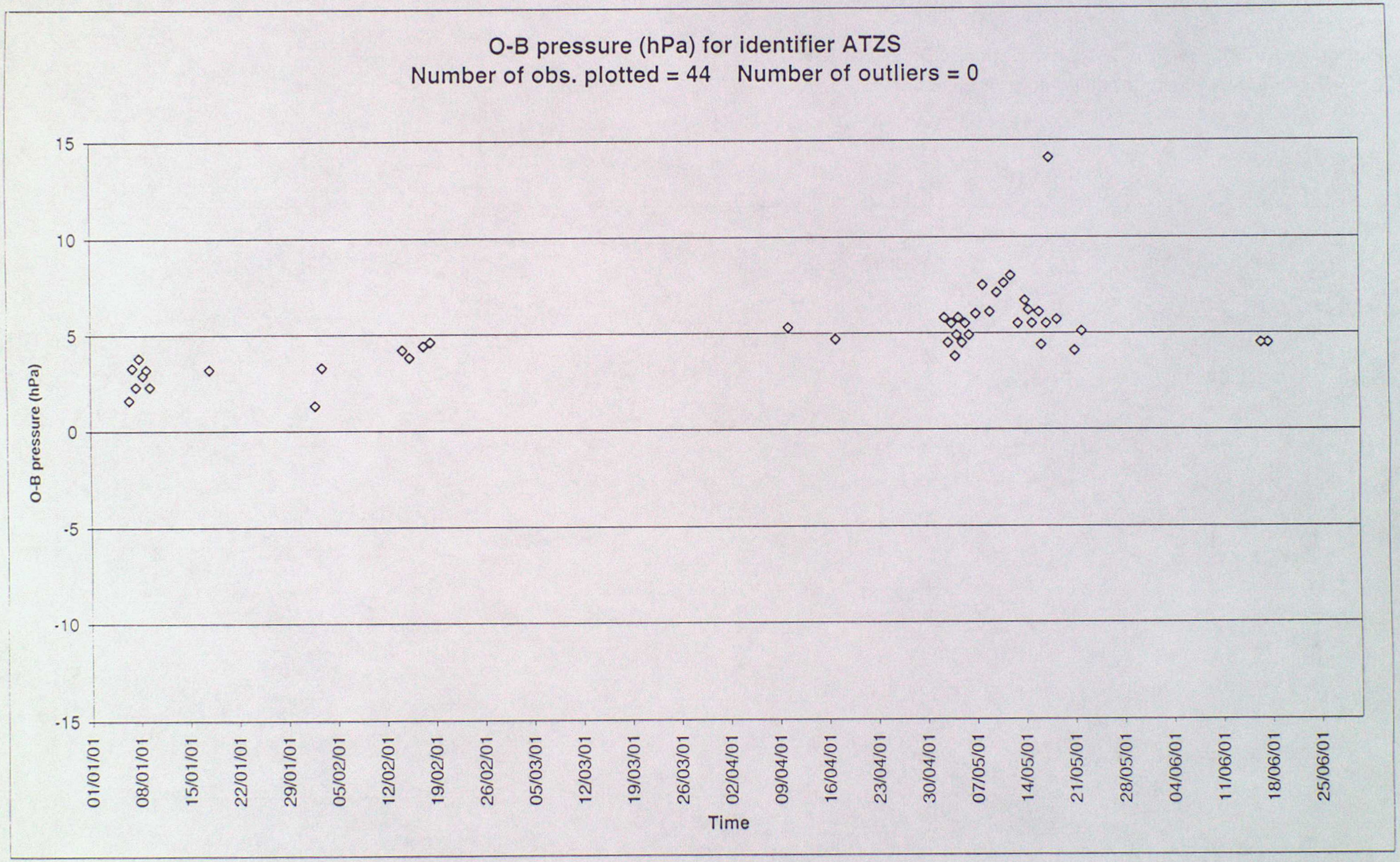
Figure 13: Standard Deviation of Ship O-B SST (degrees C). Date:- January - June 2001

Only Observations passing quality control used in statistics

Contours drawn to 10 degree boxes, if the number of observations is greater than 10

Shaded areas have a standard deviation of greater than 3.0 degrees C



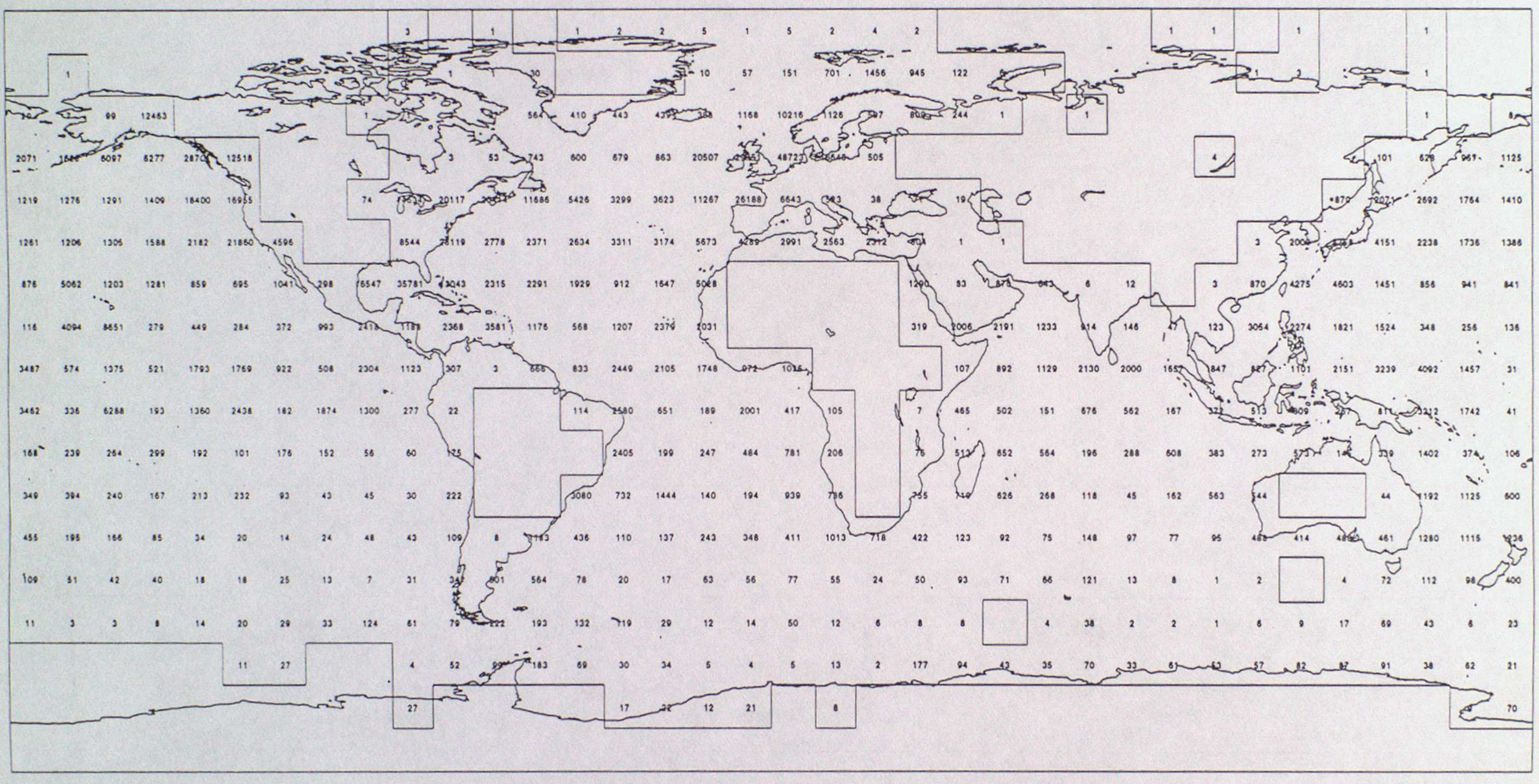


O-B pressure (hPa) for identifier ATZS
Number of obs. plotted = 44    Number of outliers = 0

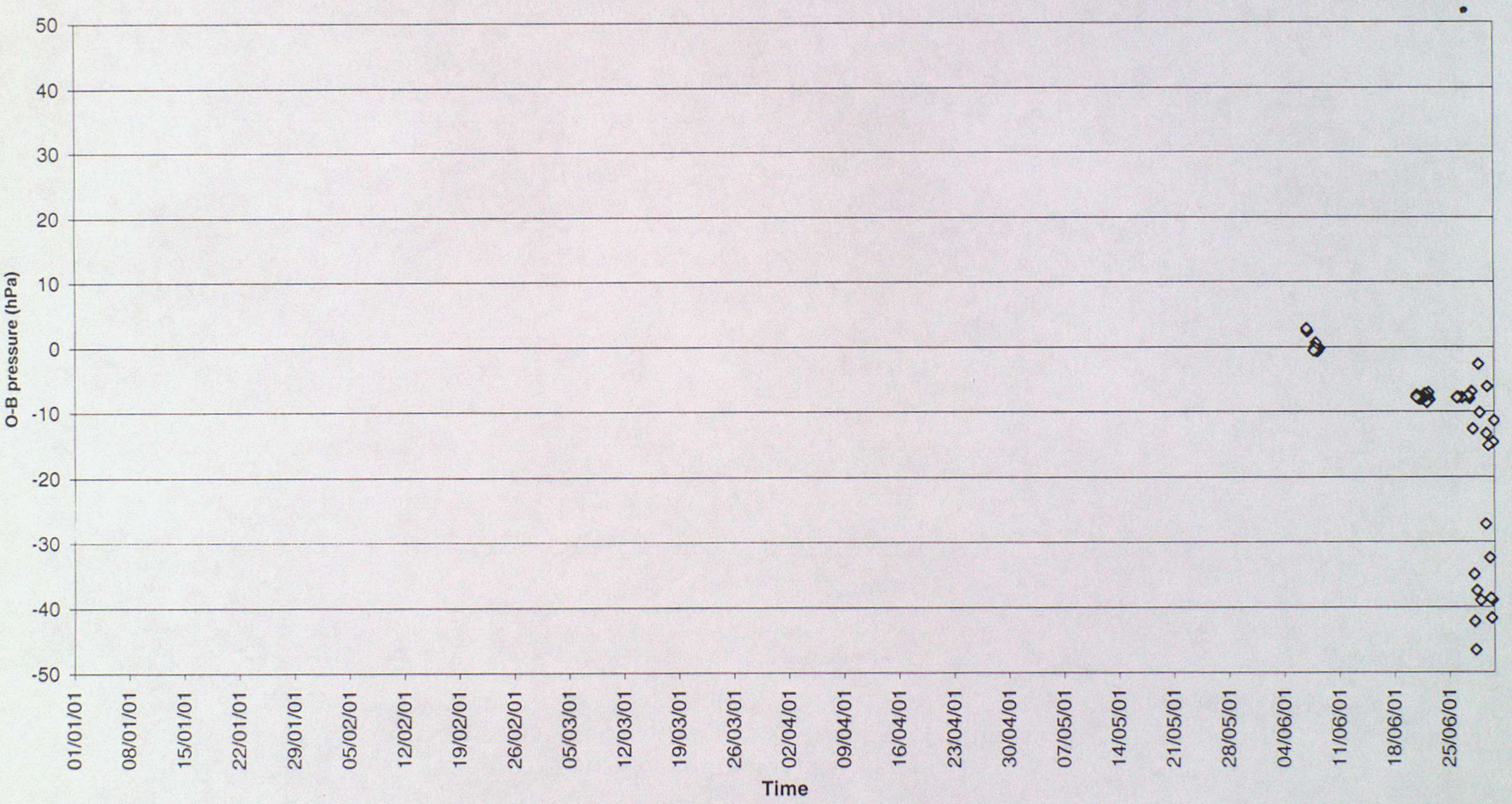
Figure 14:

Plot of the Number of Ship SST Observations. Date:- January - June 2001

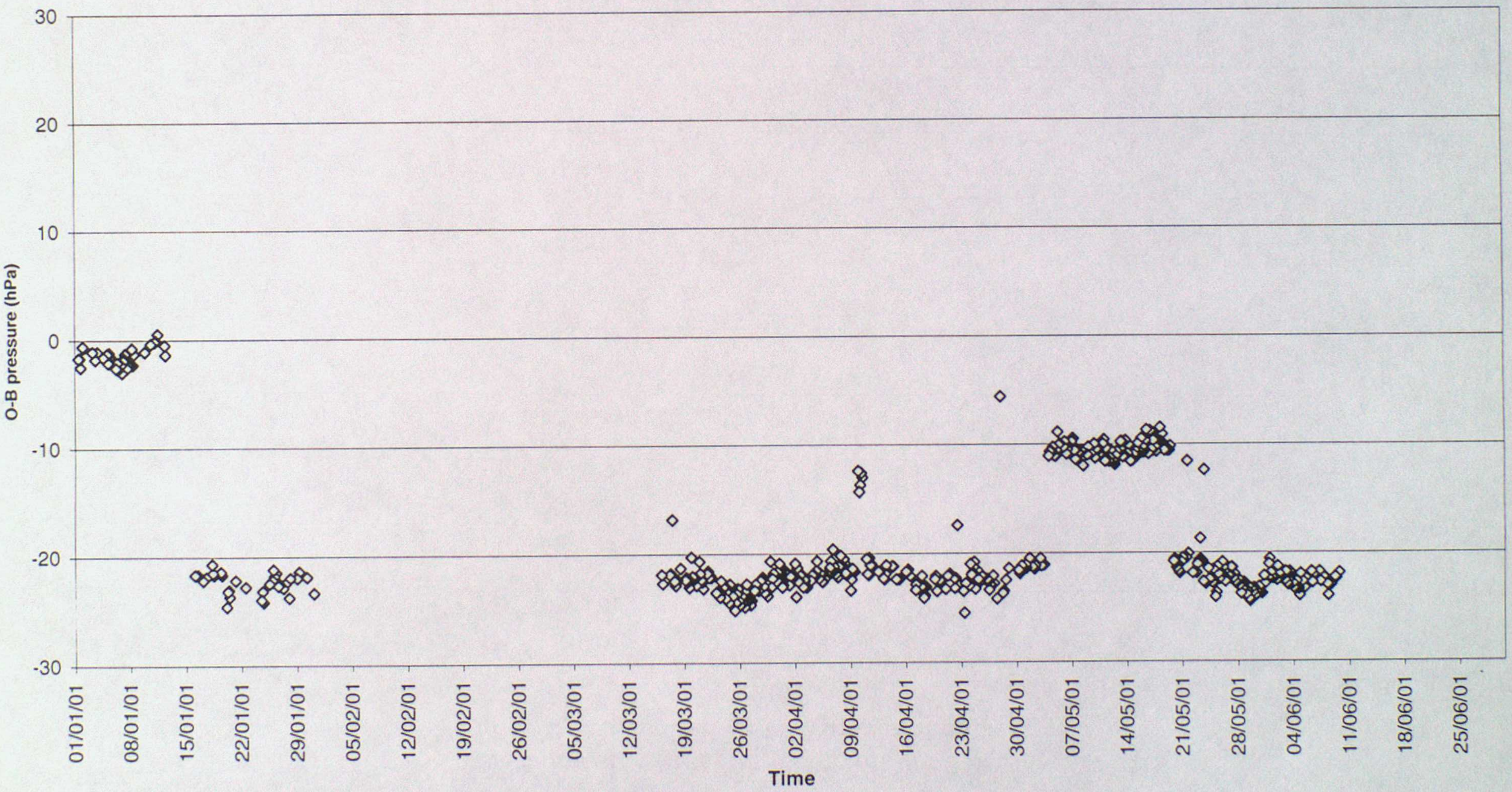
Only observations passing quality control included


3 1 1 2 2 5 1 5 2 4 2 1 1 1 1
1 1 1 30 10 57 151 701 1456 945 122 1 1 3 1
99 12463 1 564 410 443 439 1168 10216 1126 809 244 1 1 1
2071 6097 6277 2870 12518 5 3 53 743 600 679 863 20507 48723 505 4 101 628 967 1125
1219 1276 1291 1409 18400 16955 74 20117 11686 5426 3299 3623 11267 26188 6643 38 19 870 2692 1764 1410
1261 1206 1305 1588 2182 21850 4596 8544 2778 2371 2634 3311 3174 5673 4289 2991 2563 2312 1 1 3 2006 4151 2238 1736 1386
876 5062 1203 1281 859 695 1041 298 6547 35781 2315 2291 1929 912 1647 5028 1290 83 6 12 3 870 4275 4603 1451 856 941 841
116 4094 8651 279 449 284 372 993 2368 3581 1176 568 1207 2379 2031 319 2006 2191 1233 914 146 47 123 3054 2274 1821 1524 348 256 136
3487 574 1375 521 1793 1769 922 508 2304 1123 307 3 833 2449 2105 1748 1036 107 892 1129 2130 2000 1657 847 1101 2151 3239 4092 1457 31
3462 336 6288 193 1360 2438 182 1874 1300 277 22 114 2580 651 189 2001 417 105 7 465 502 151 676 562 167 513 1742 41
168 239 264 299 192 101 176 152 56 60 2405 199 247 484 781 206 76 652 564 196 288 608 383 273 1402 106
349 394 240 167 213 232 93 43 45 30 222 3080 732 1444 140 194 939 736 626 268 118 45 162 563 44 1192 1125 600
455 195 166 85 34 20 14 24 48 43 109 8 436 110 137 243 348 411 1013 718 422 123 92 75 148 97 77 95 414 461 1280 1115
109 51 42 40 18 18 25 13 7 31 801 564 78 20 17 63 56 77 55 24 50 93 71 66 121 13 8 1 2 4 72 112 98 400
11 3 3 8 14 20 29 33 124 61 79 222 193 132 119 29 12 14 50 12 6 8 8 4 38 2 2 1 6 9 17 69 43 6 23
11 27 4 52 183 69 30 34 5 4 5 13 2 177 94 43 35 70 33 61 63 57 82 87 91 38 62 21
27 17 22 12 21 8 70

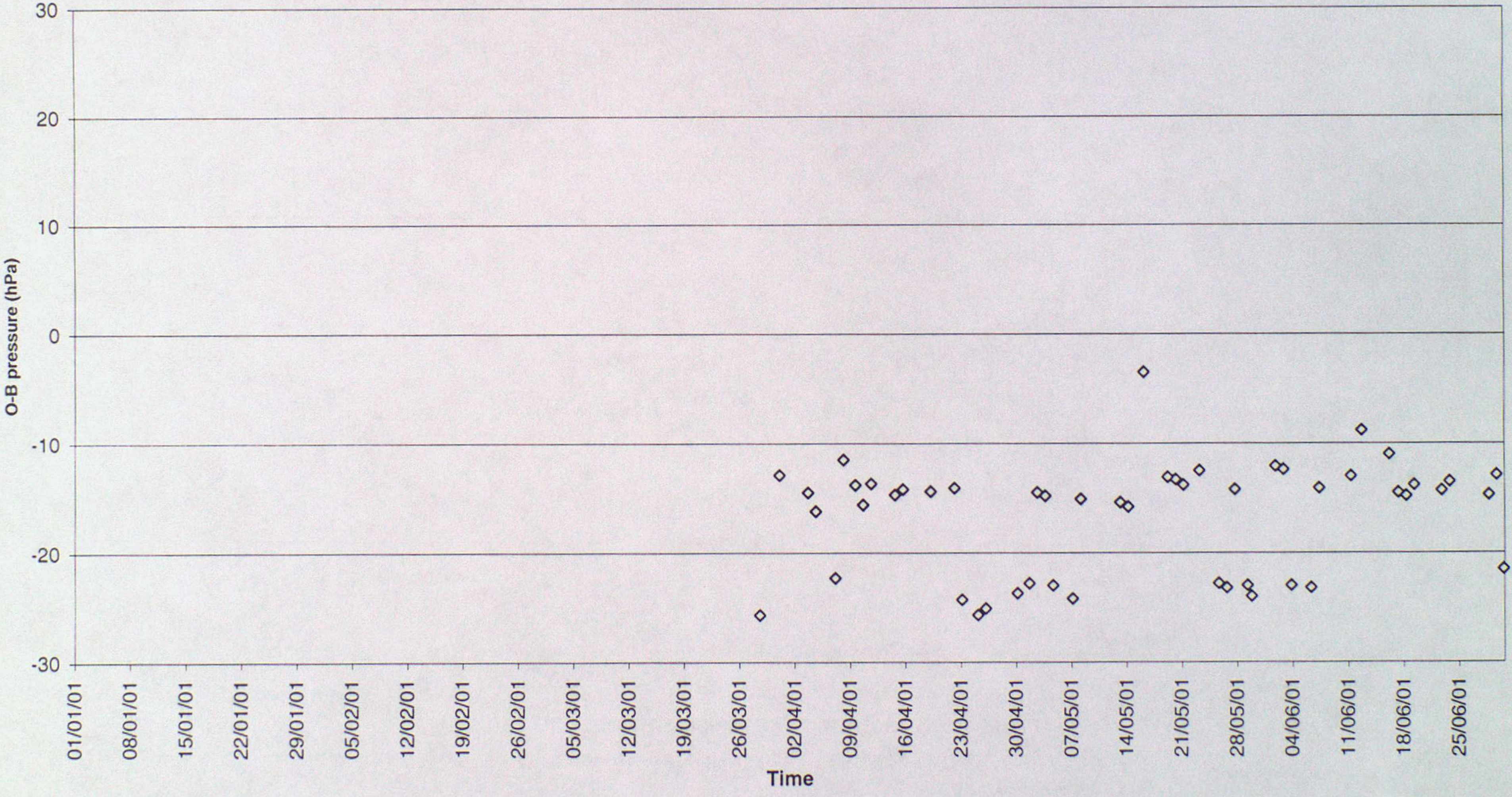
O-B pressure (hPa) for identifier AVOSTEST
Number of obs. plotted = 51    Number of outliers = 4



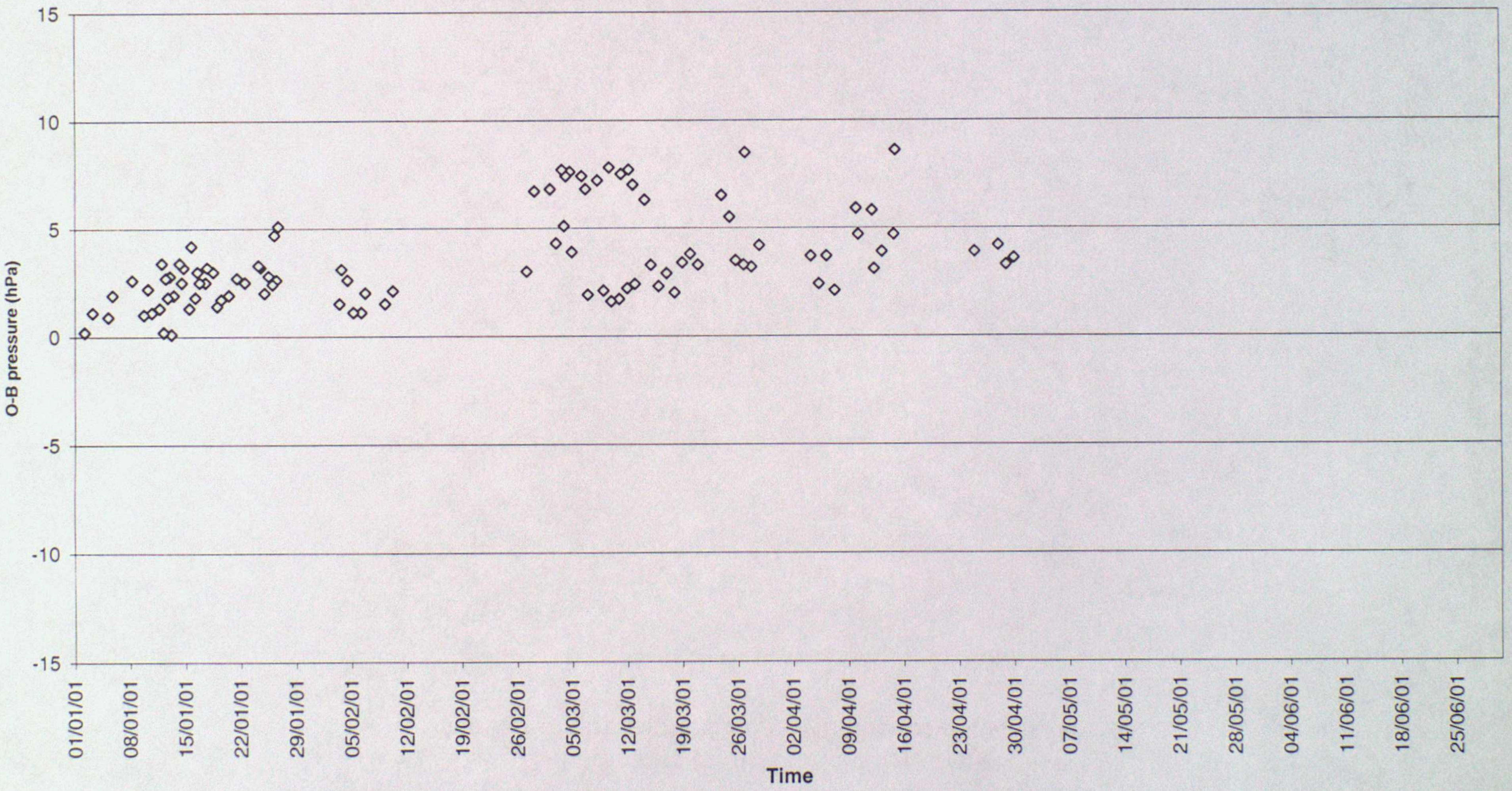
O-B pressure (hPa) for identifier CGDS
Number of obs. plotted = 505    Number of outliers = 3

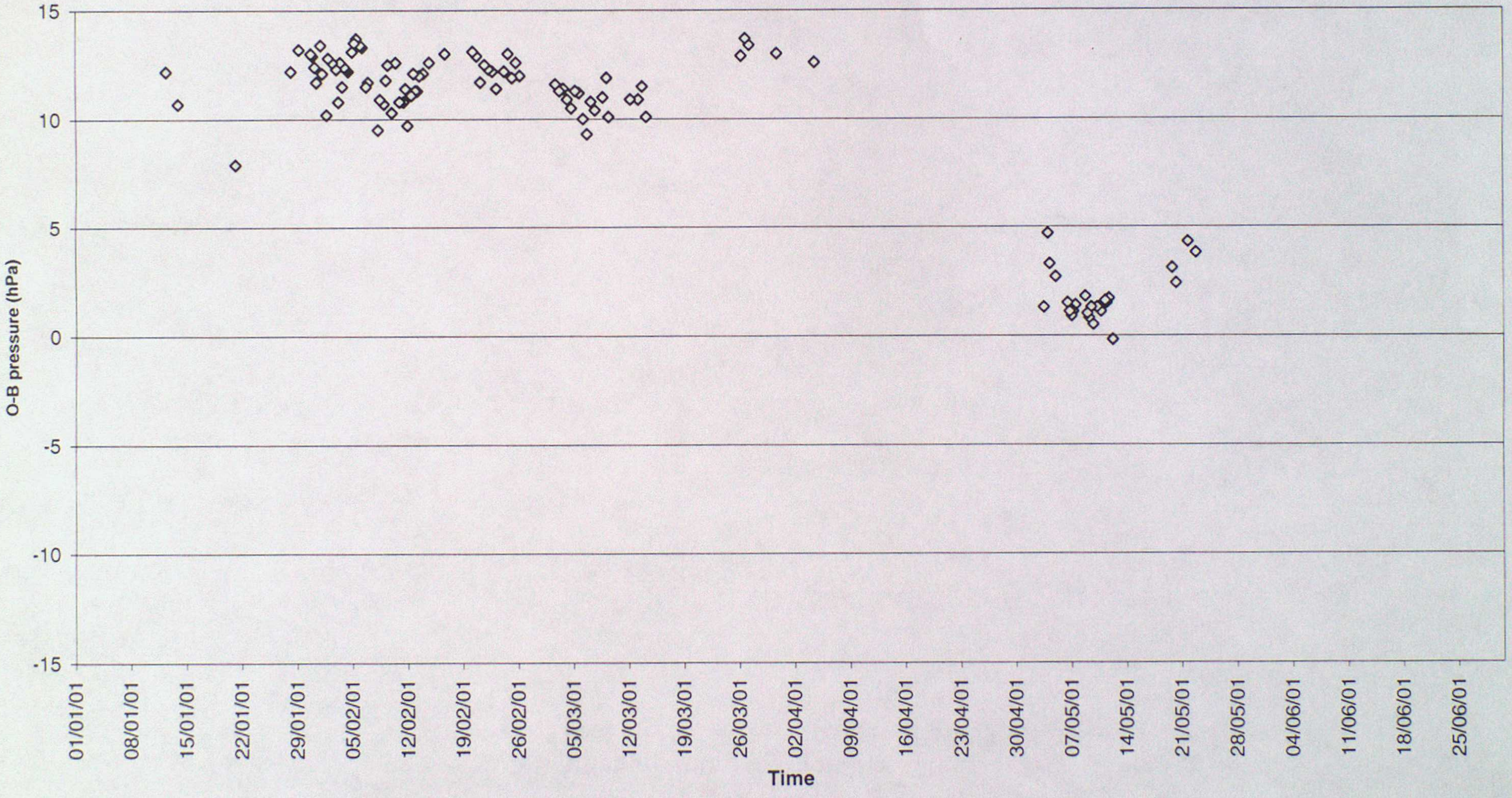


O-B pressure (hPa) for identifier CYLX
Number of obs. plotted = 51    Number of outliers = 0



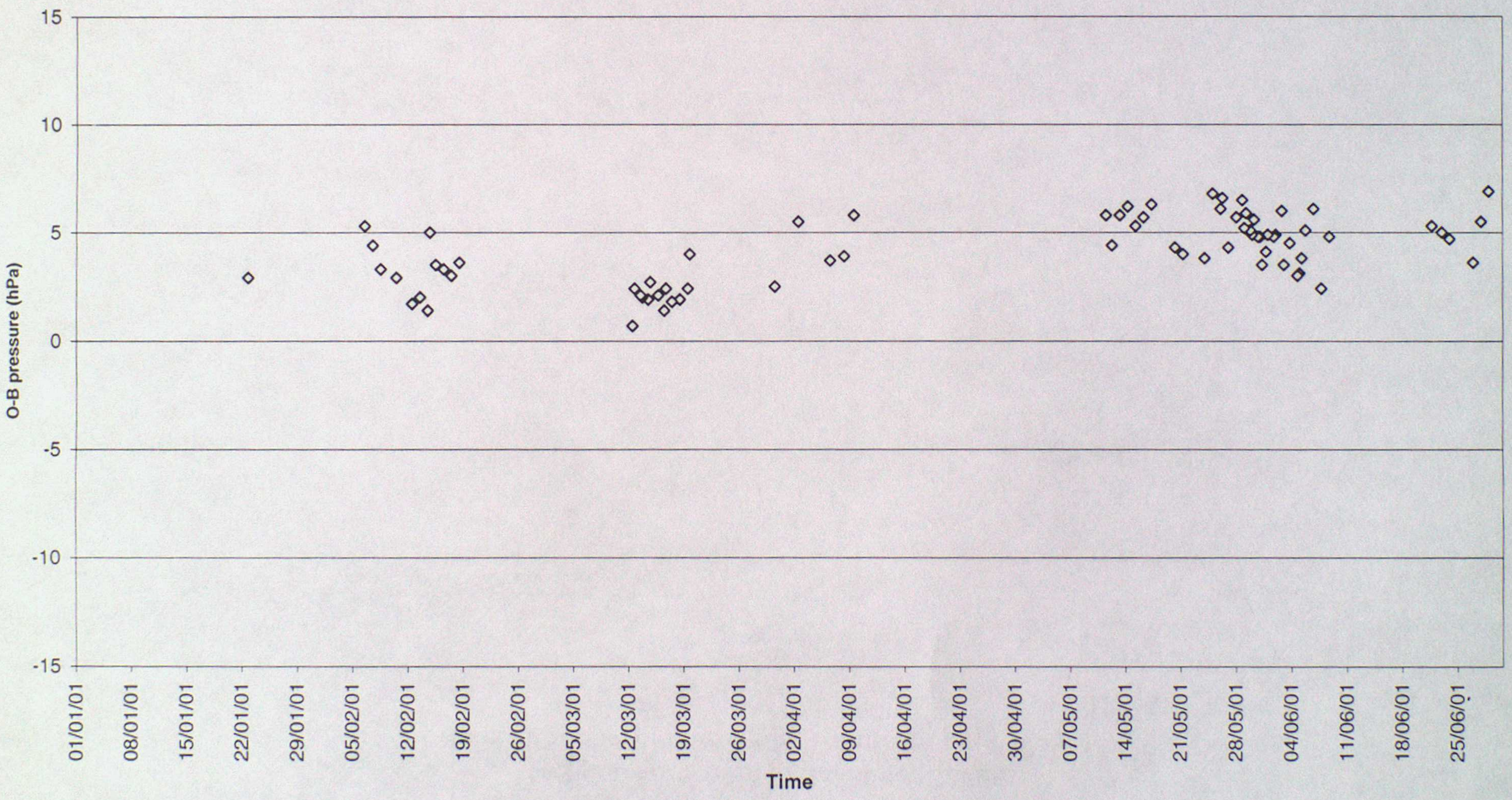
O-B pressure (hPa) for identifier C6FD9
Number of obs. plotted = 100    Number of outliers = 0



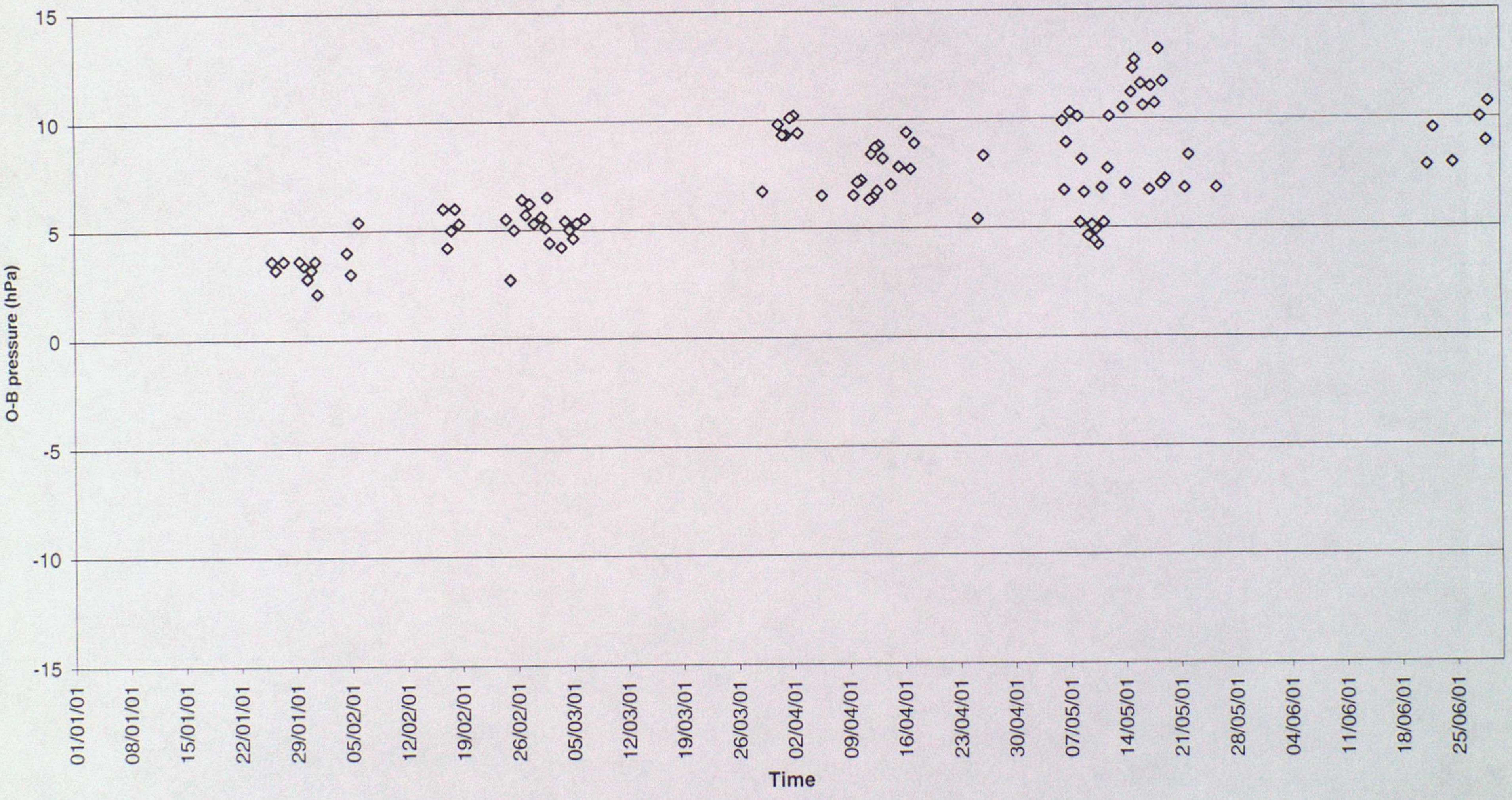


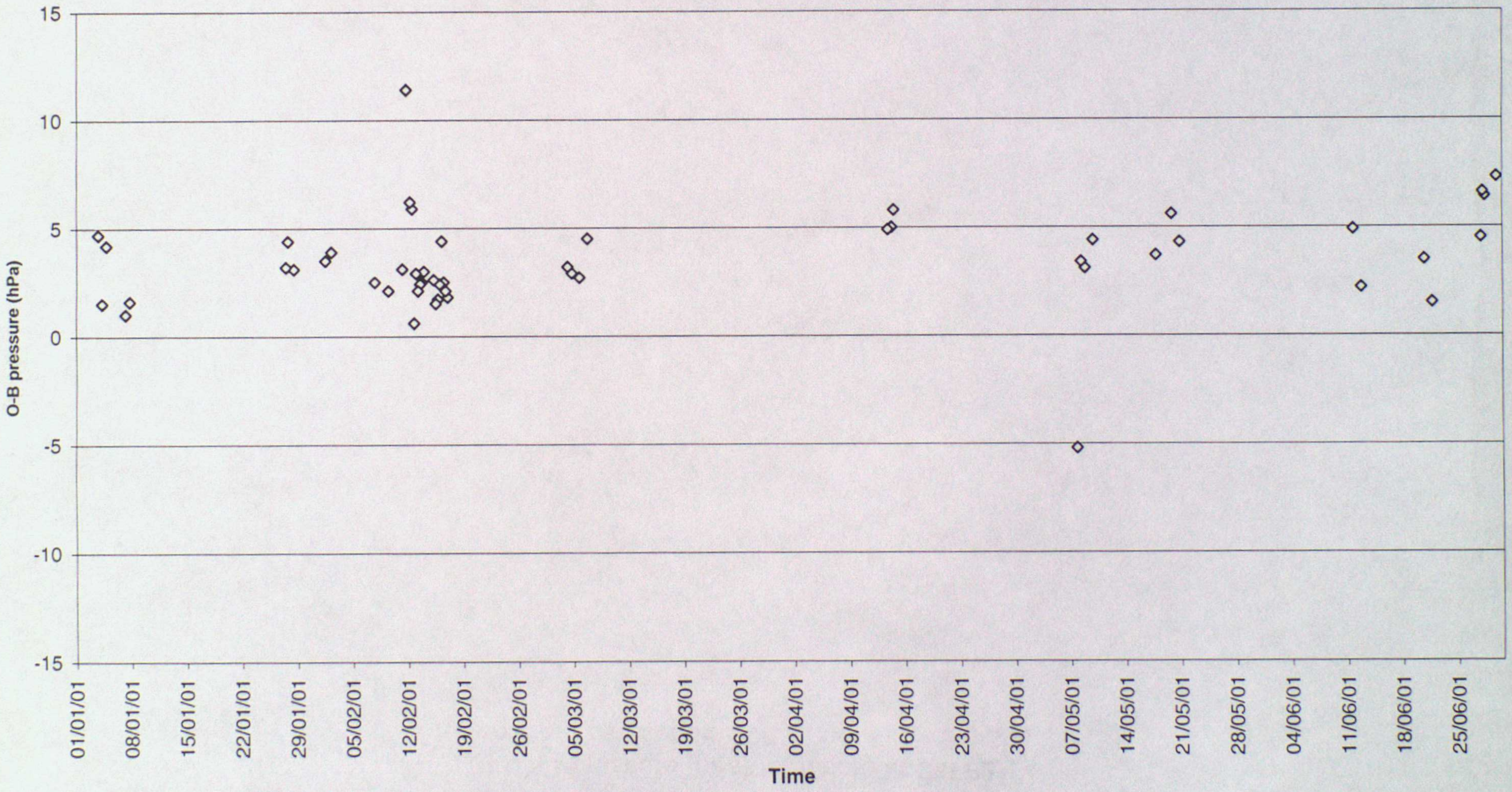
O-B pressure (hPa) for identifier C6FE5
Number of obs. plotted = 106    Number of outliers = 1

O-B pressure (hPa) for identifier C6FE6
Number of obs. plotted = 75    Number of outliers = 0



O-B pressure (hPa) for identifier C6FP2
Number of obs. plotted = 99    Number of outliers = 0

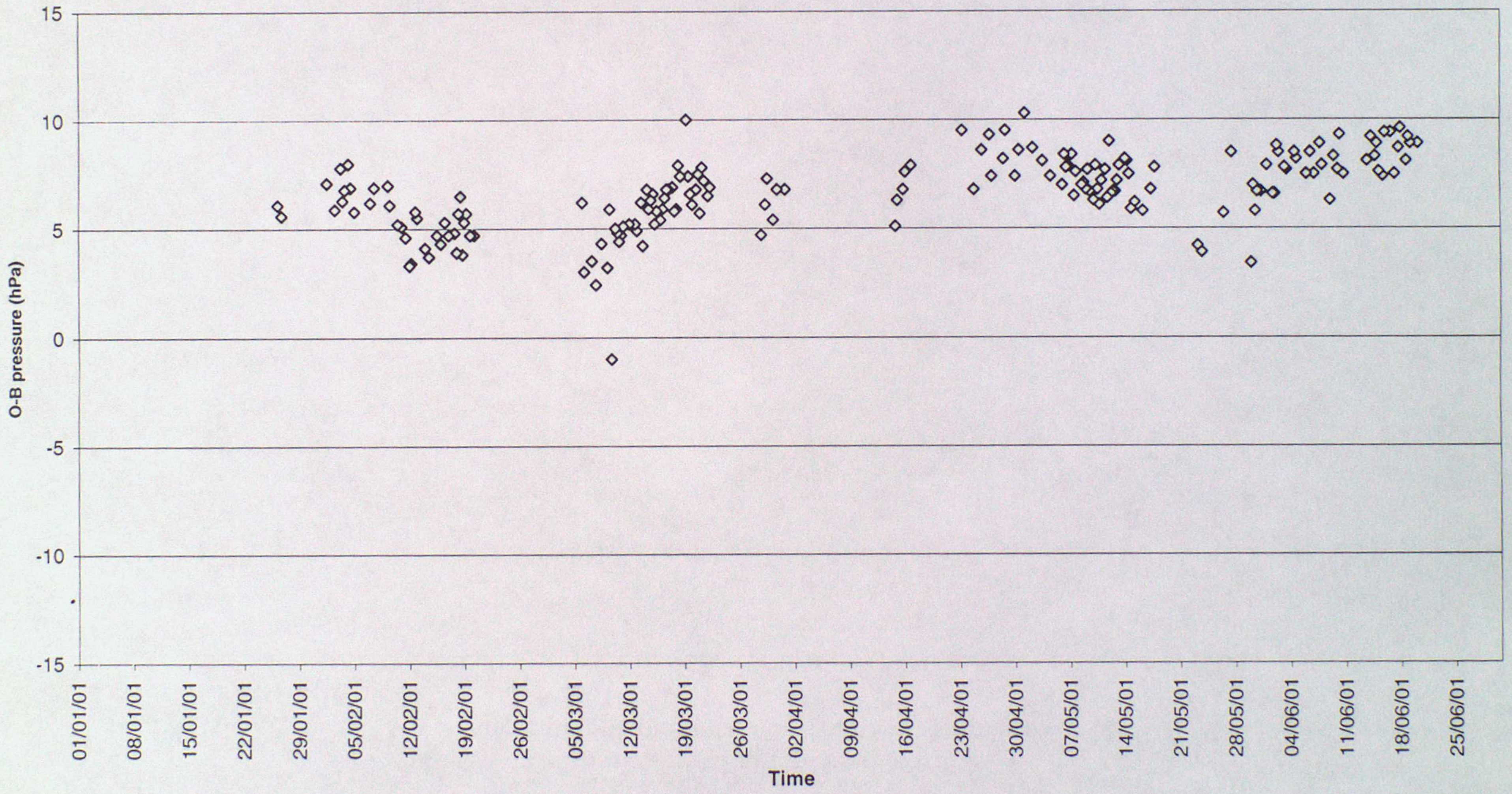




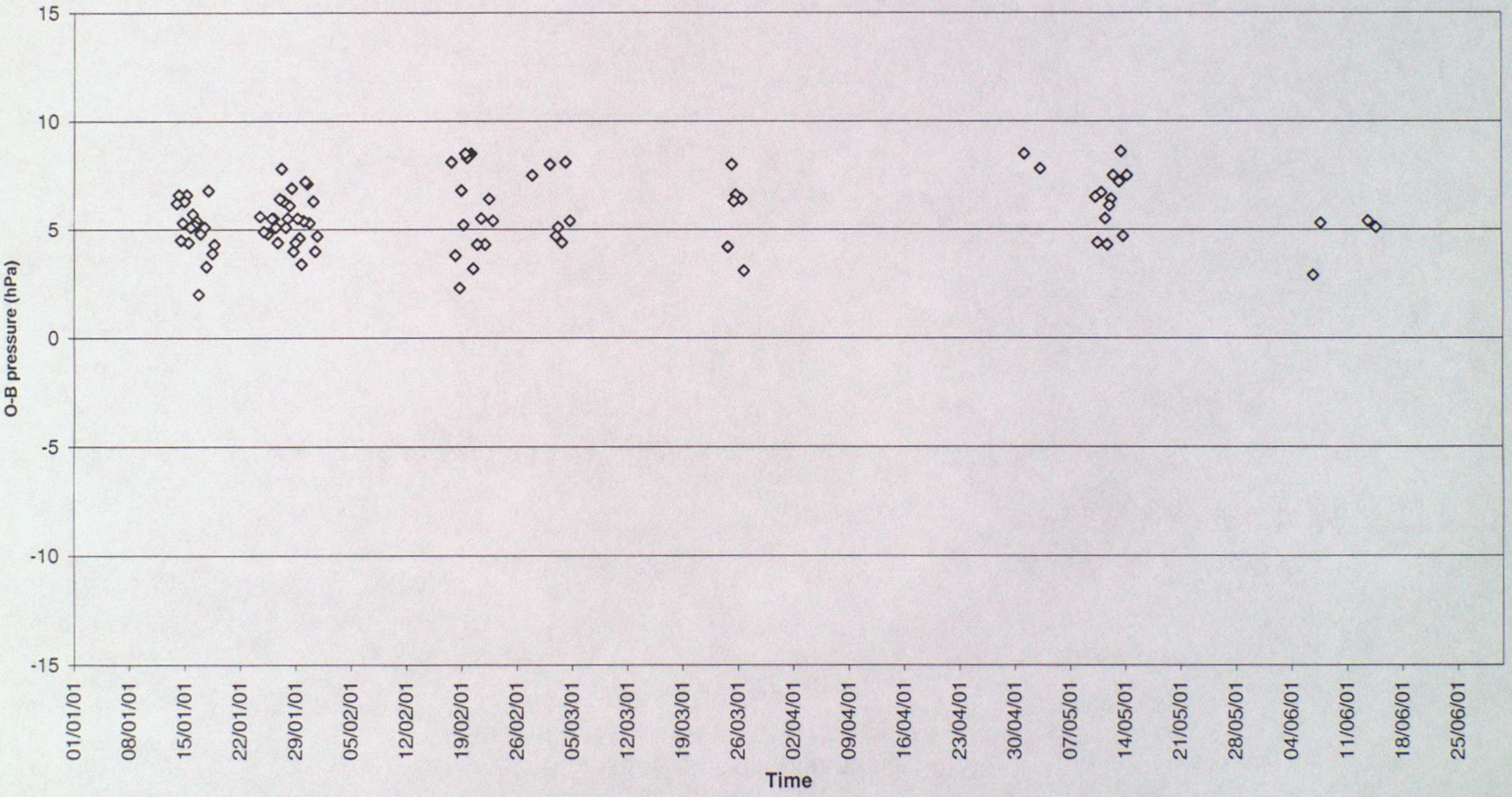
O-B pressure (hPa) for identifier C6LU3
Number of obs. plotted = 52    Number of outliers = 0

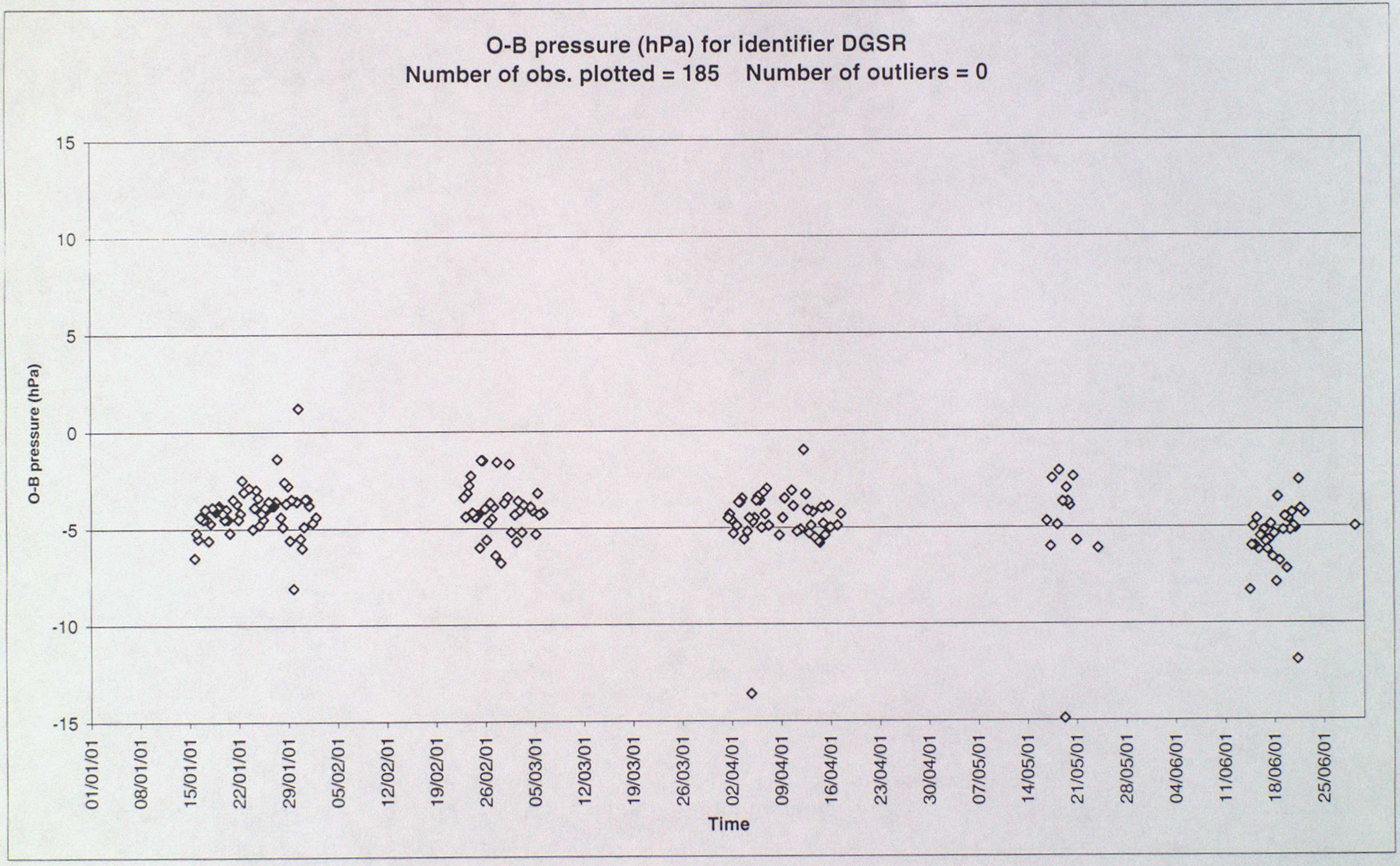
O-B pressure (hPa) for identifier C6PZ3

Number of obs. plotted = 181    Number of outliers = 0



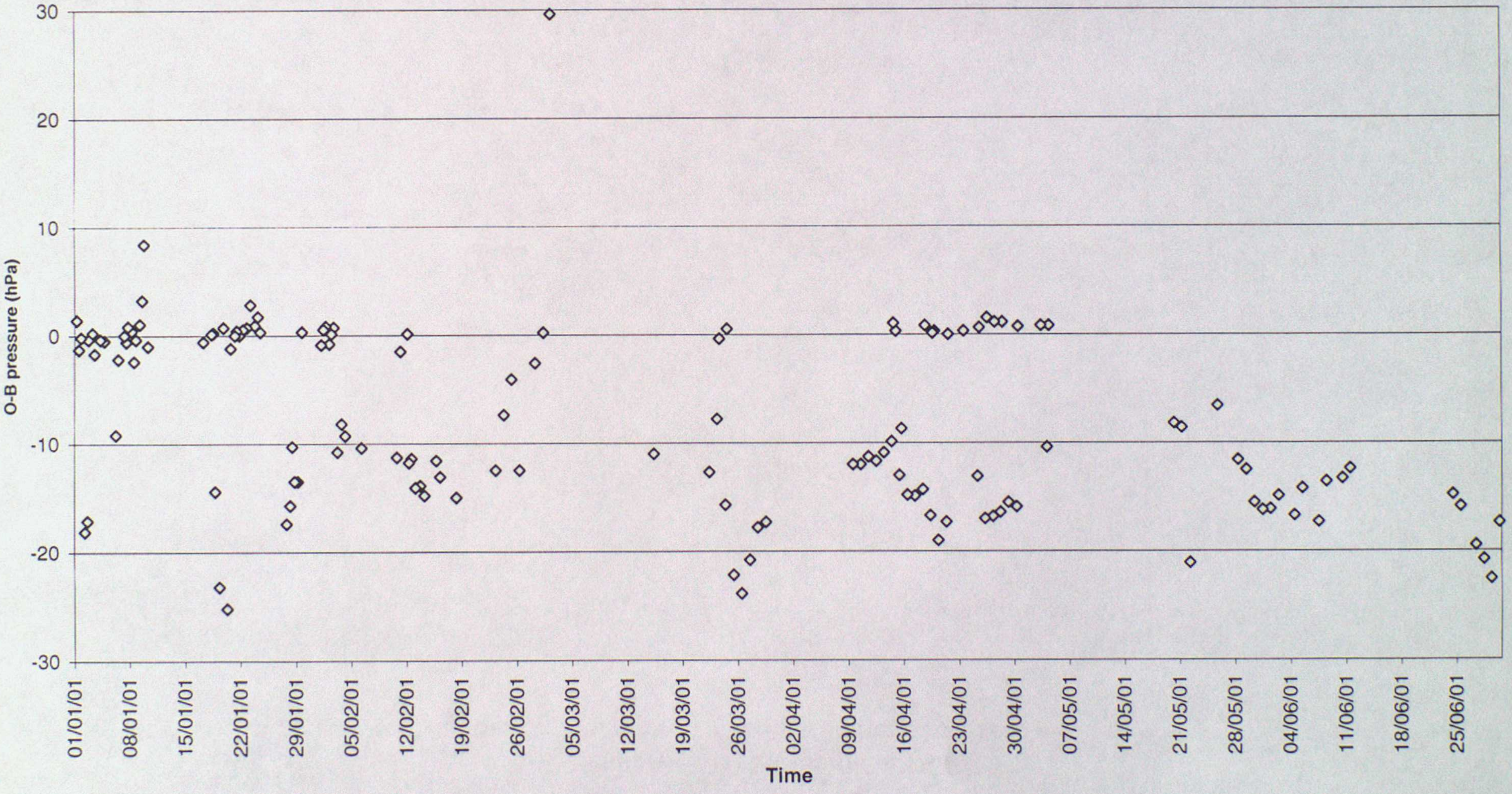
O-B pressure (hPa) for identifier C6QK
Number of obs. plotted = 90    Number of outliers = 0



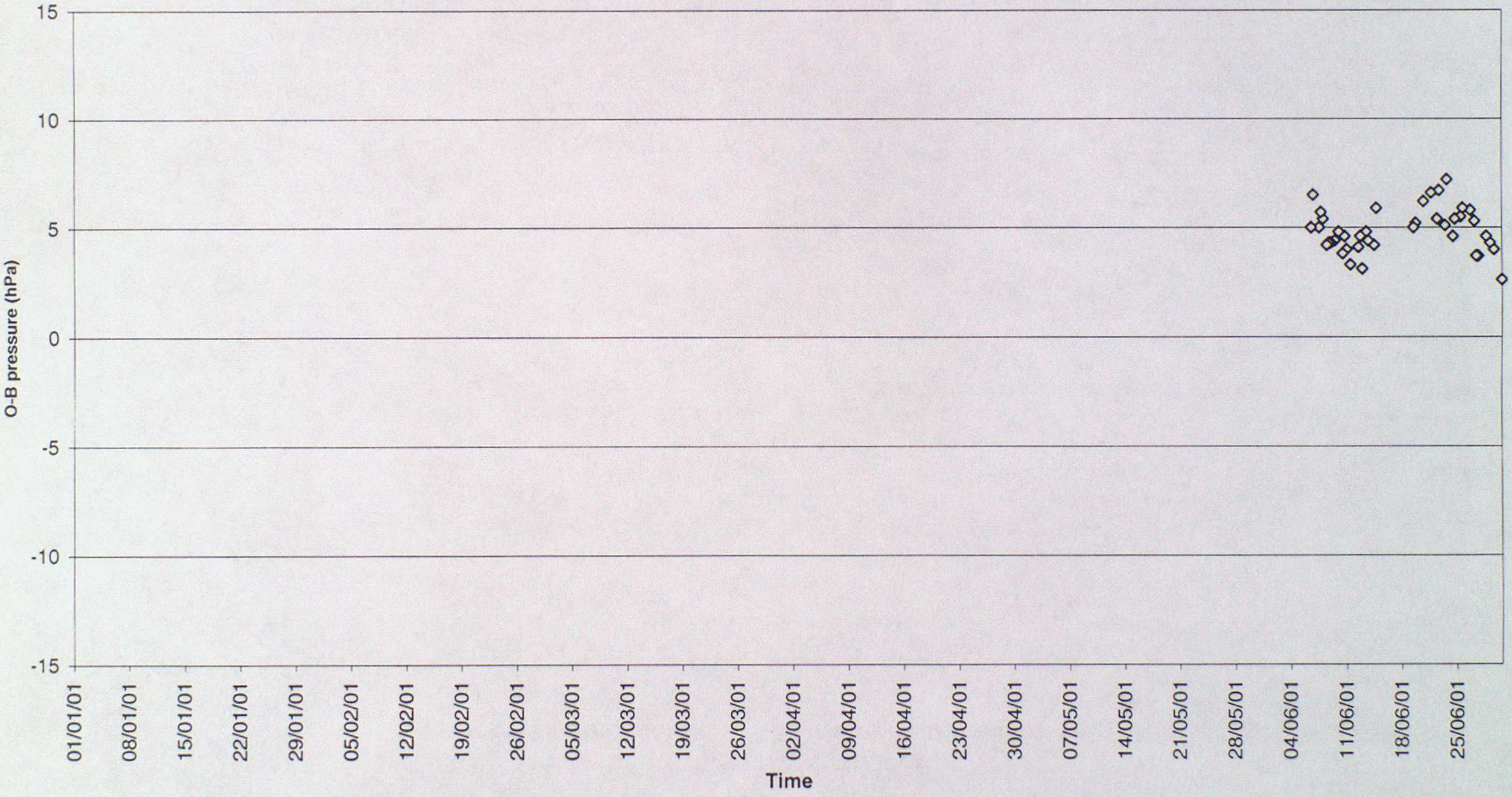


O-B pressure (hPa) for identifier DGSR
Number of obs. plotted = 185    Number of outliers = 0

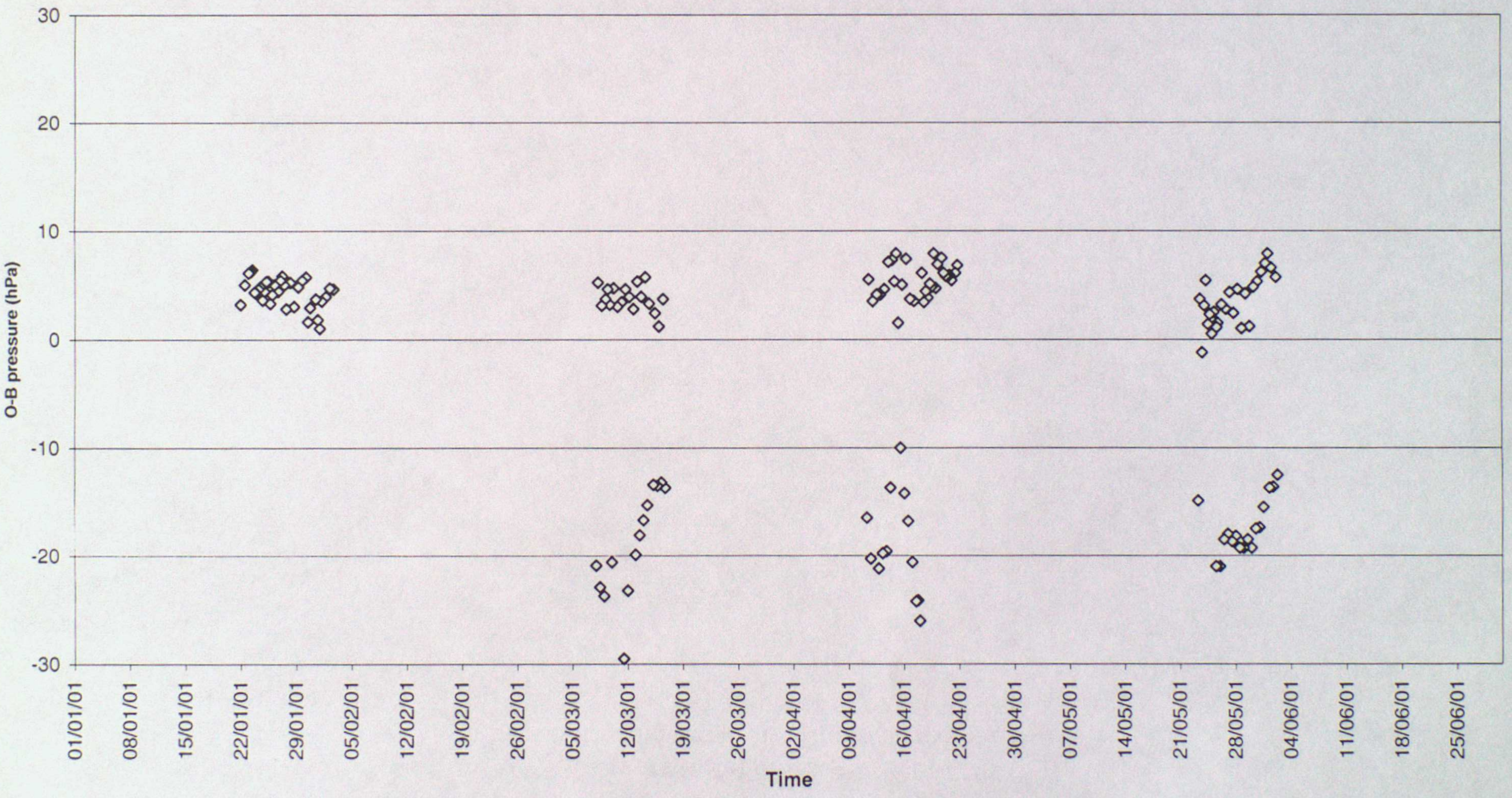
O-B pressure (hPa) for identifier DPBP
Number of obs. plotted = 141    Number of outliers = 1

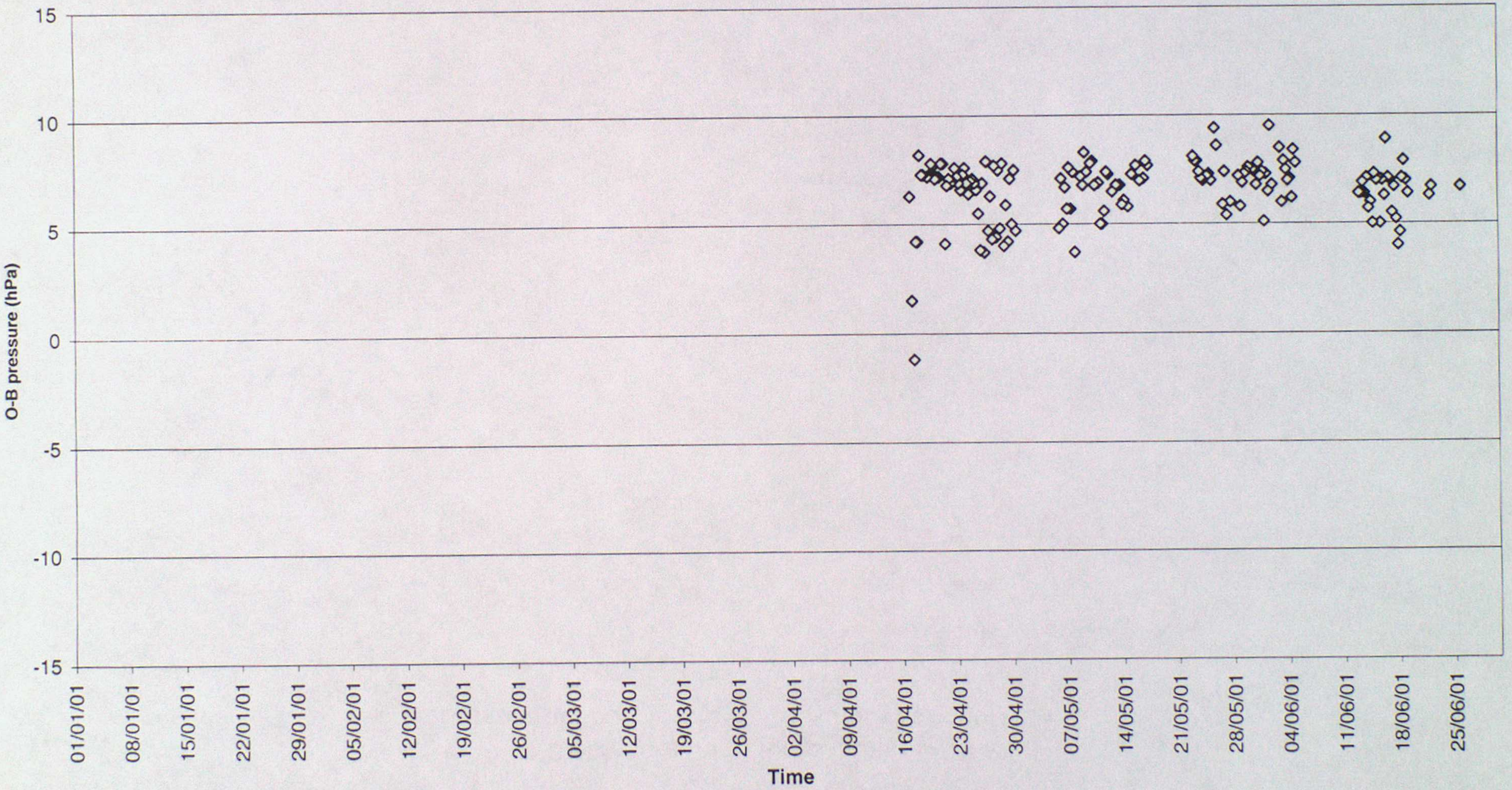


O-B pressure (hPa) for identifier ELAQ5
Number of obs. plotted = 41    Number of outliers = 0



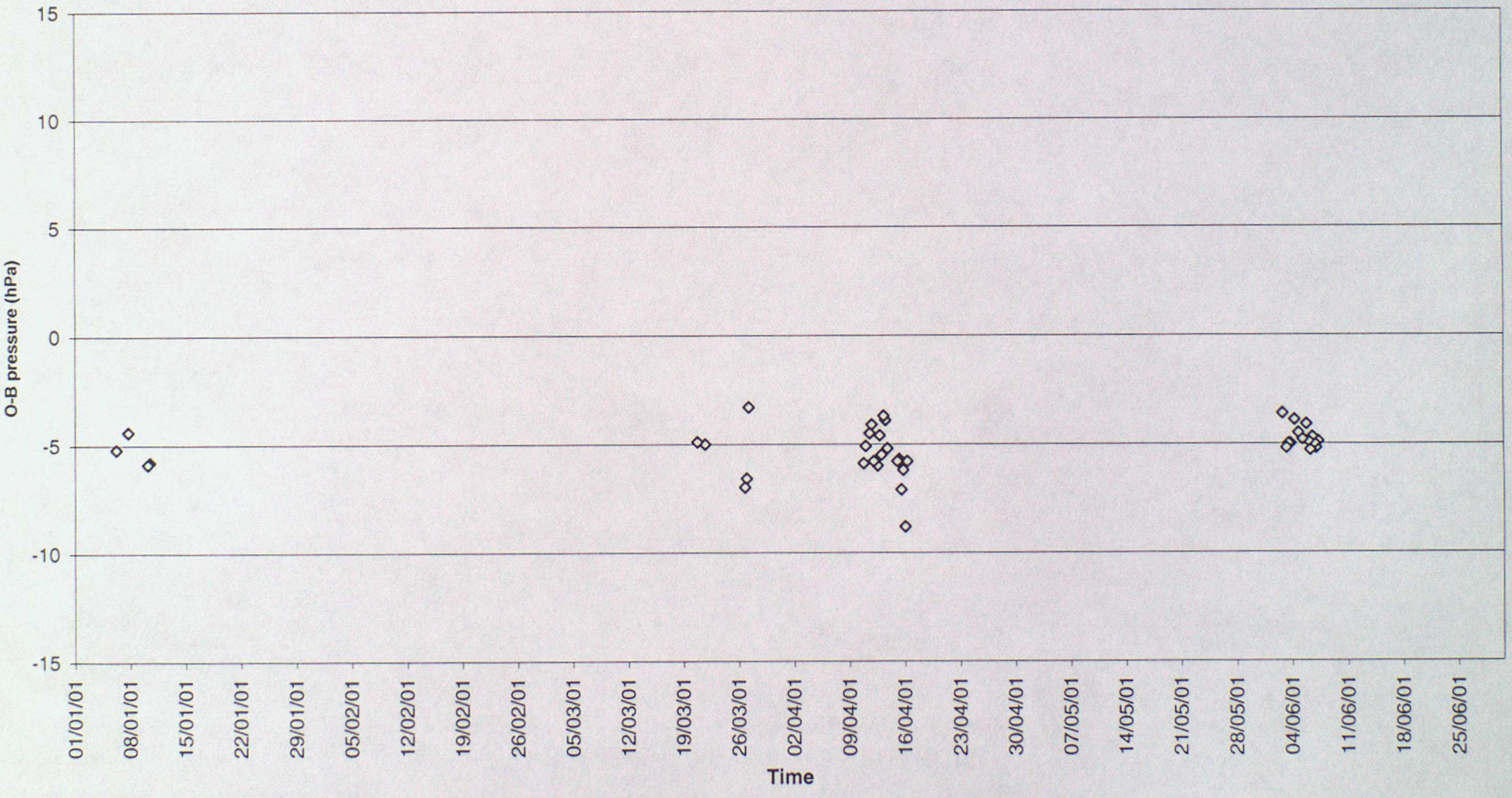
O-B pressure (hPa) for identifier ELGG3
Number of obs. plotted = 153    Number of outliers = 0



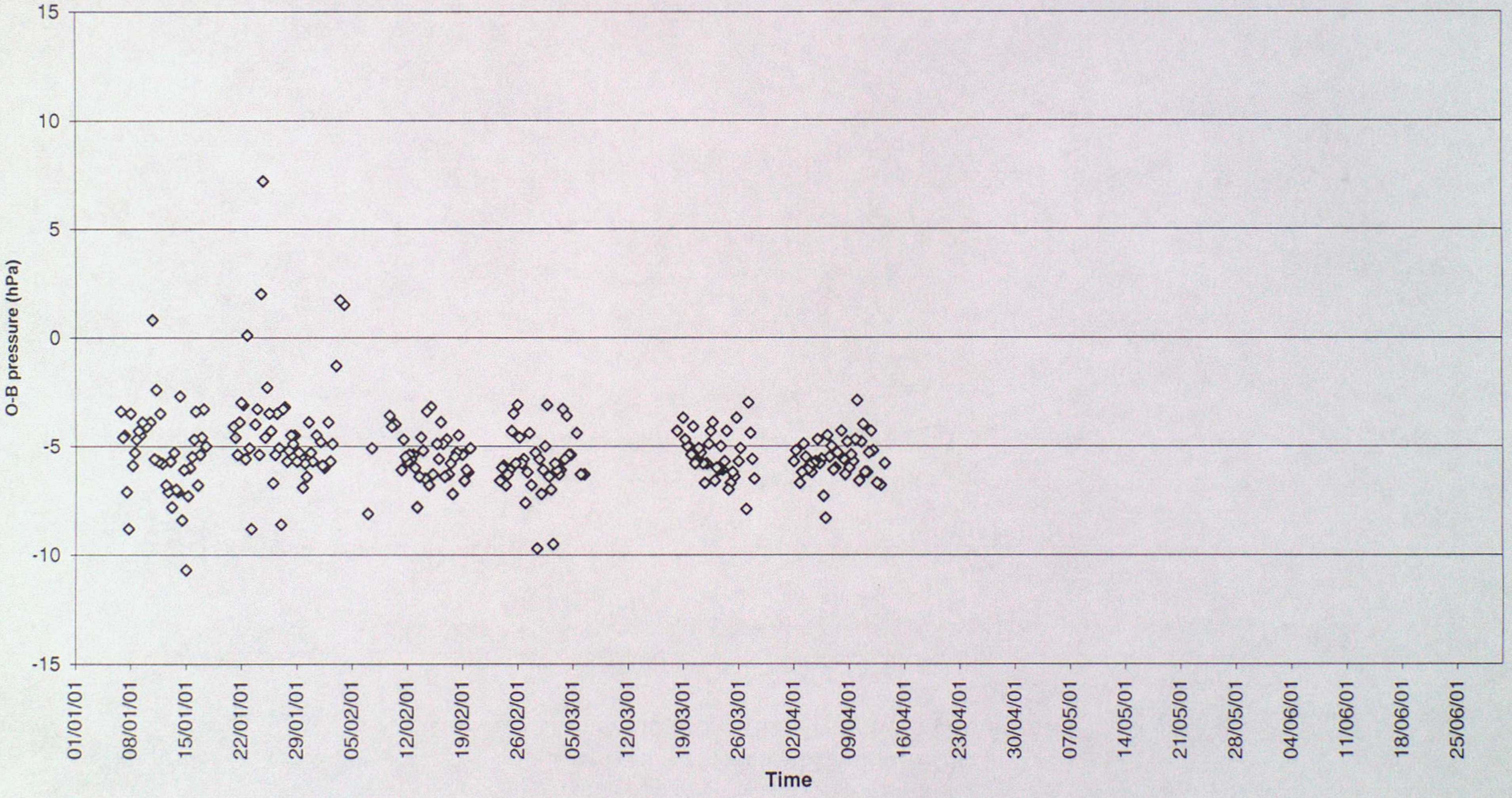


O-B pressure (hPa) for identifier ELJL8
Number of obs. plotted = 158    Number of outliers = 4

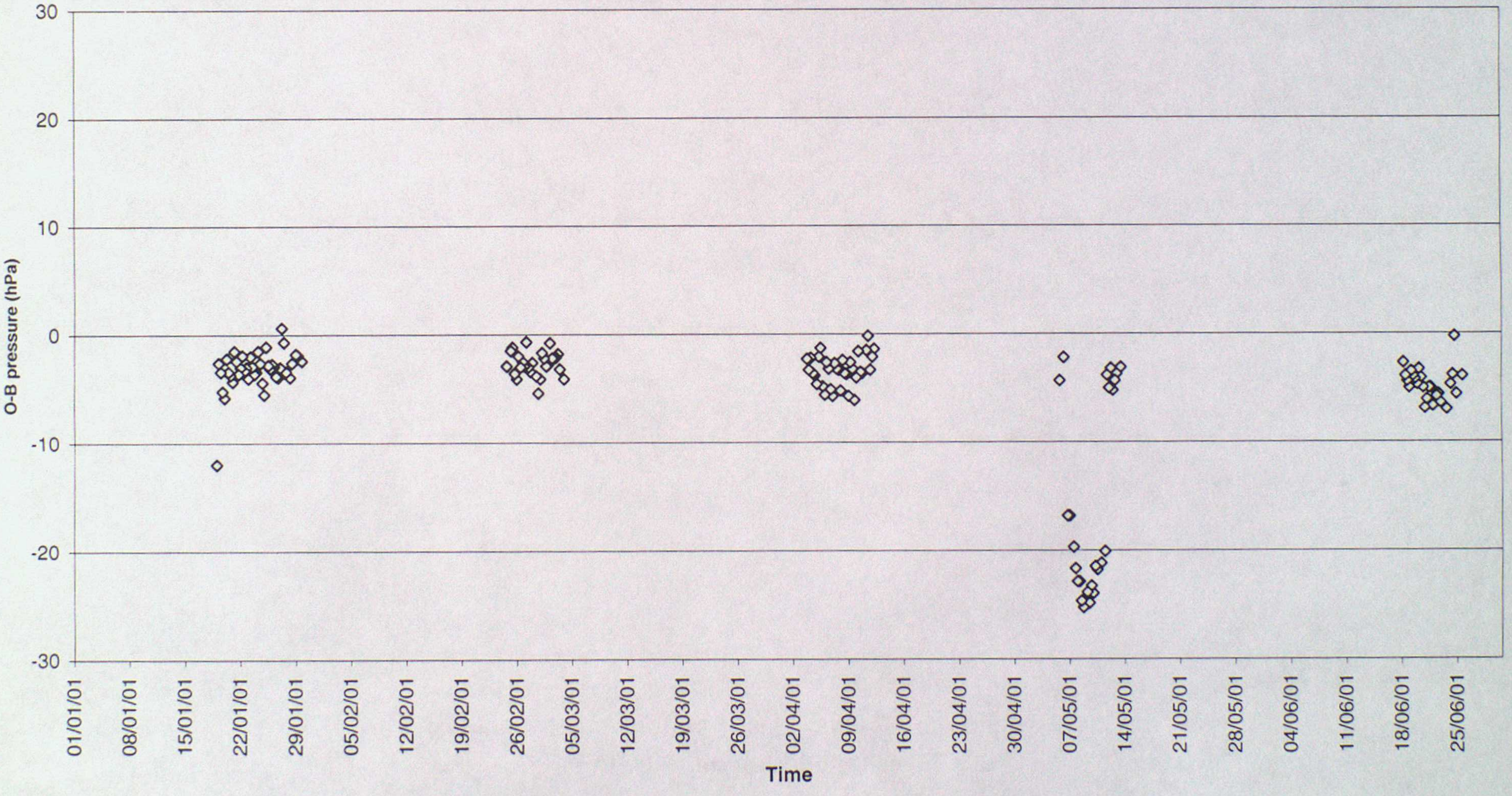
O-B pressure (hPa) for identifier ELRR2
Number of obs. plotted = 40    Number of outliers = 0

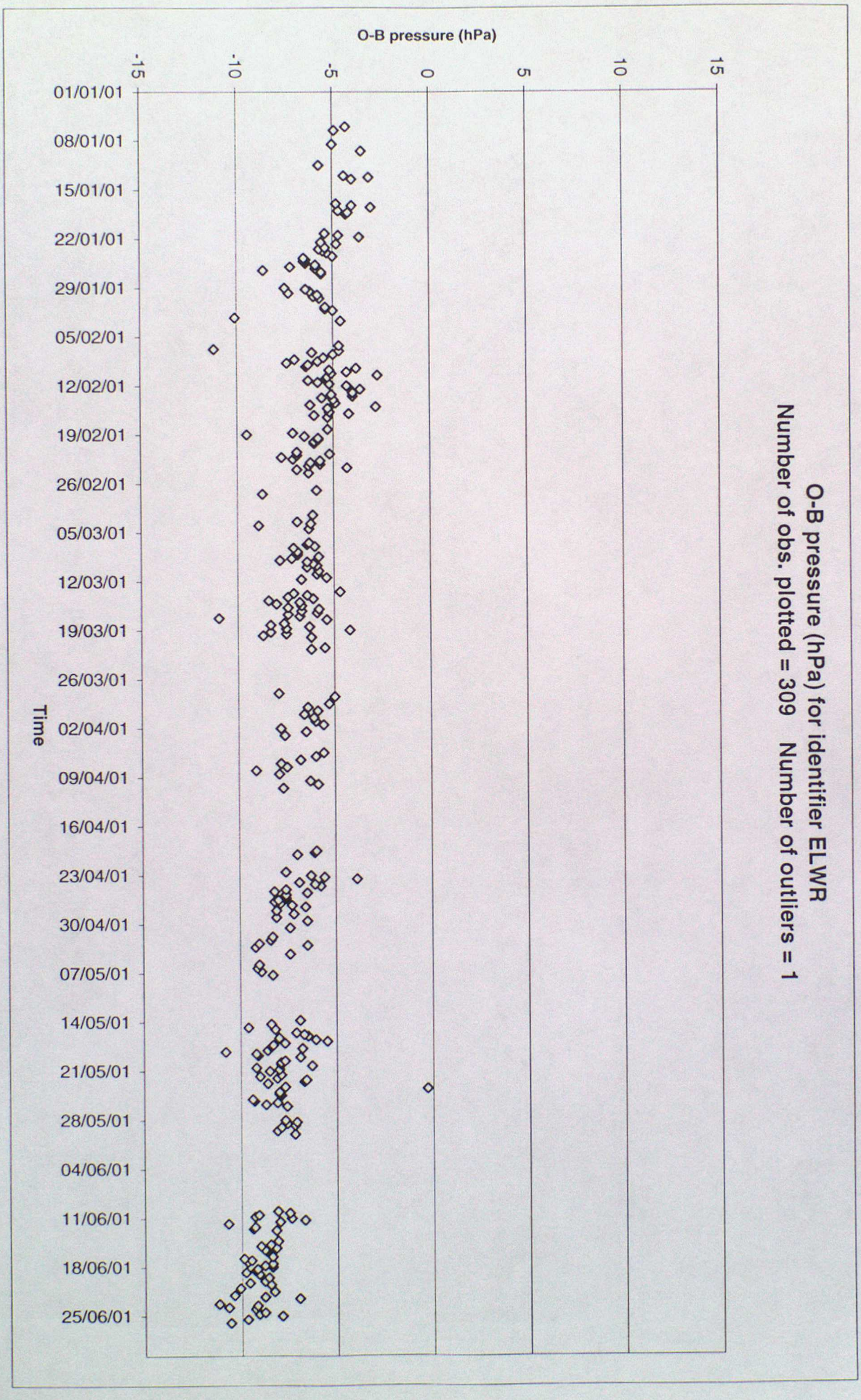


O-B pressure (hPa) for identifier ELVJ9
Number of obs. plotted = 248    Number of outliers = 0



O-B pressure (hPa) for identifier ELVY8
Number of obs. plotted = 152    Number of outliers = 0

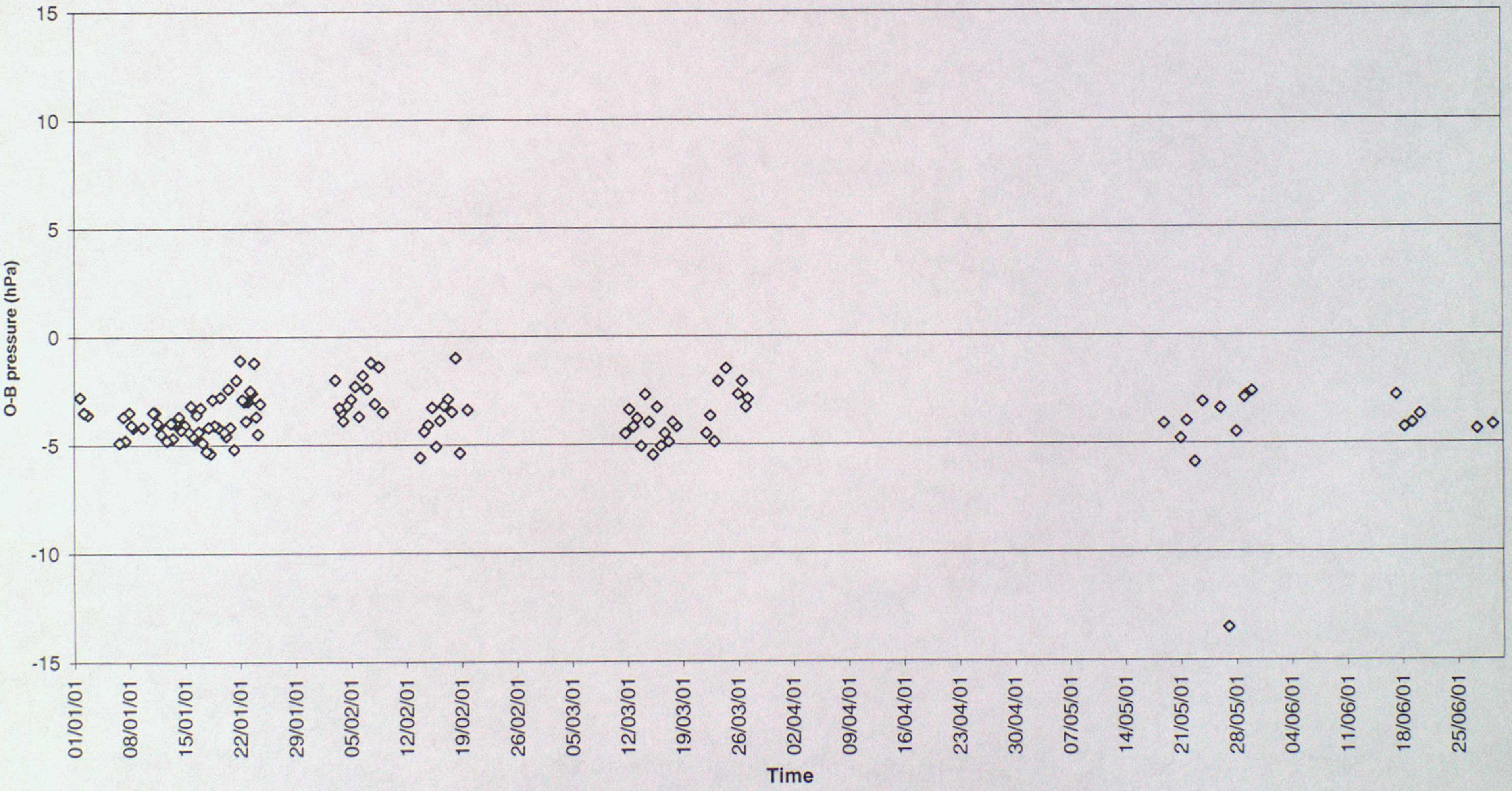




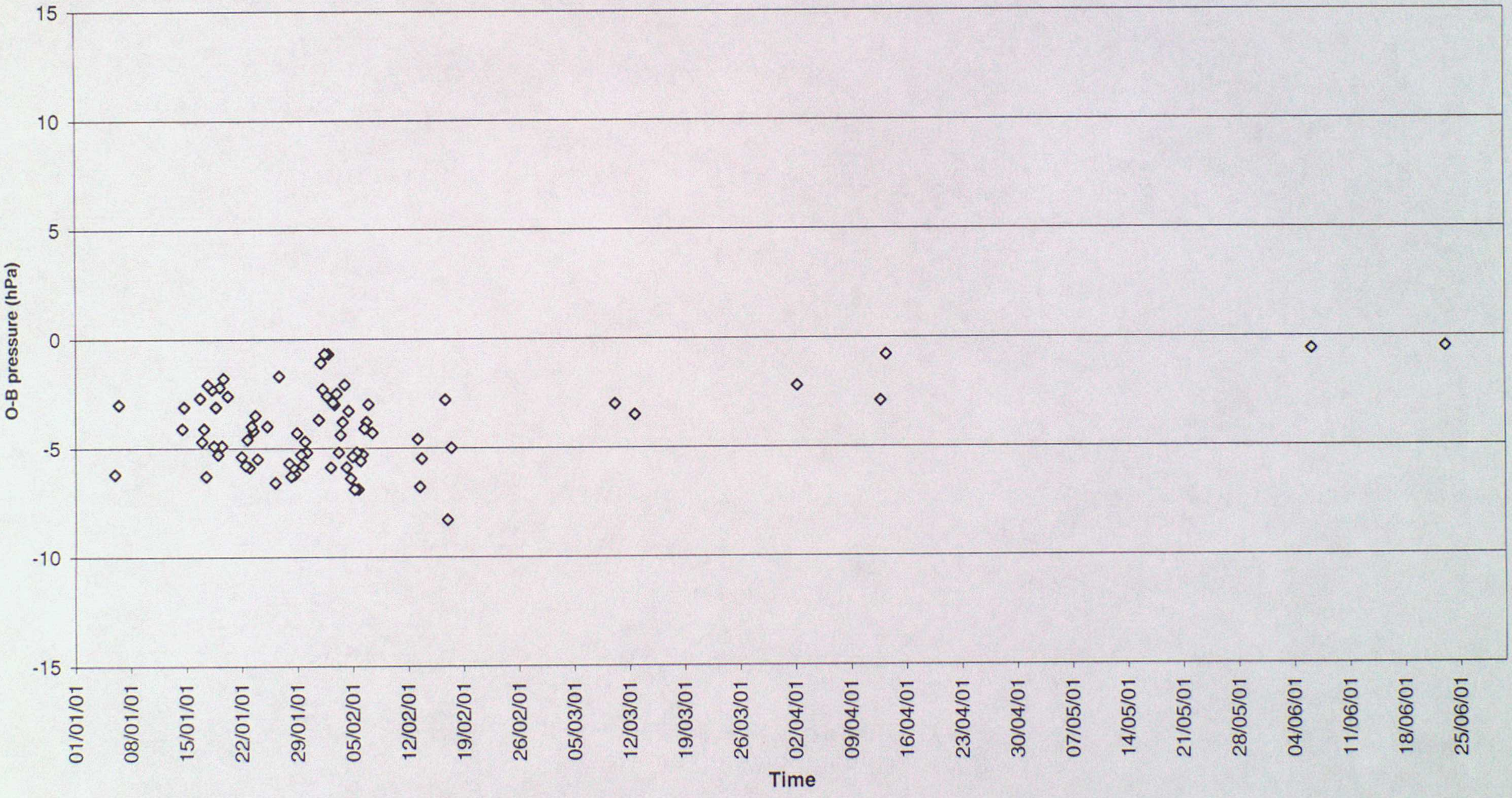
O-B pressure (hPa) for identifier ELWR

Number of obs. plotted = 309    Number of outliers = 1

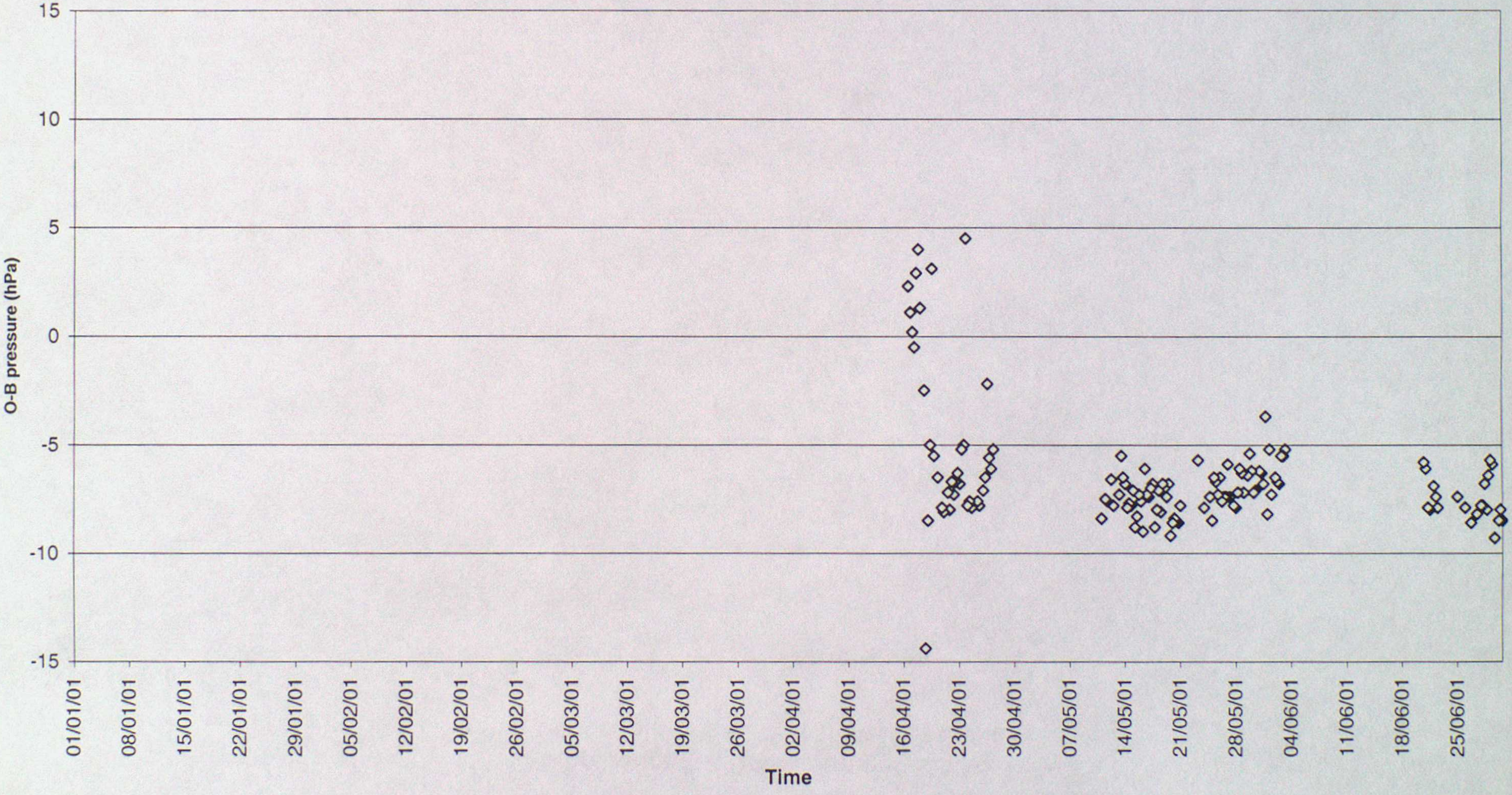
O-B pressure (hPa) for identifier ELXZ7
Number of obs. plotted = 121    Number of outliers = 0



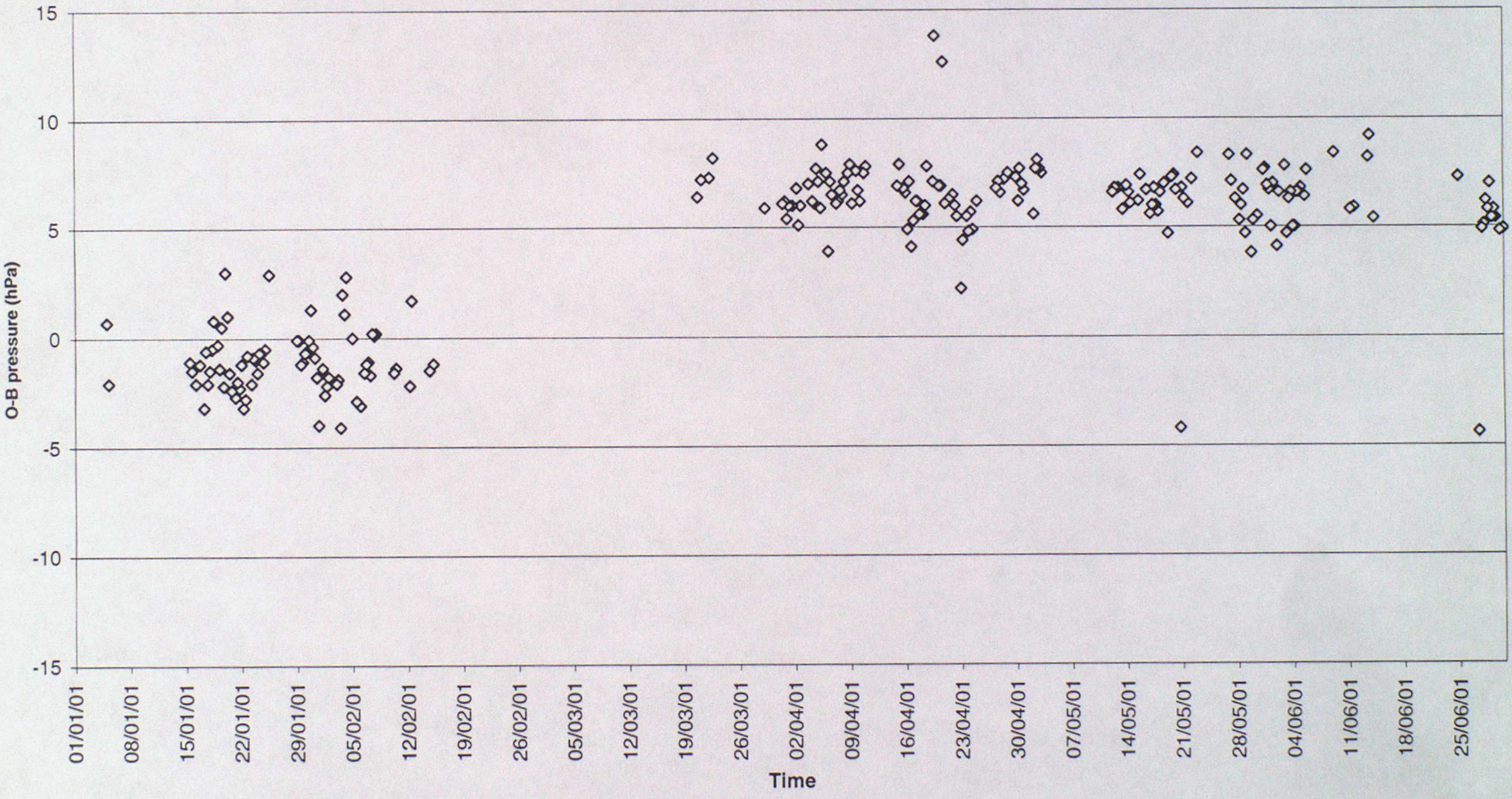
O-B pressure (hPa) for identifier ELYM3
Number of obs. plotted = 77    Number of outliers = 0



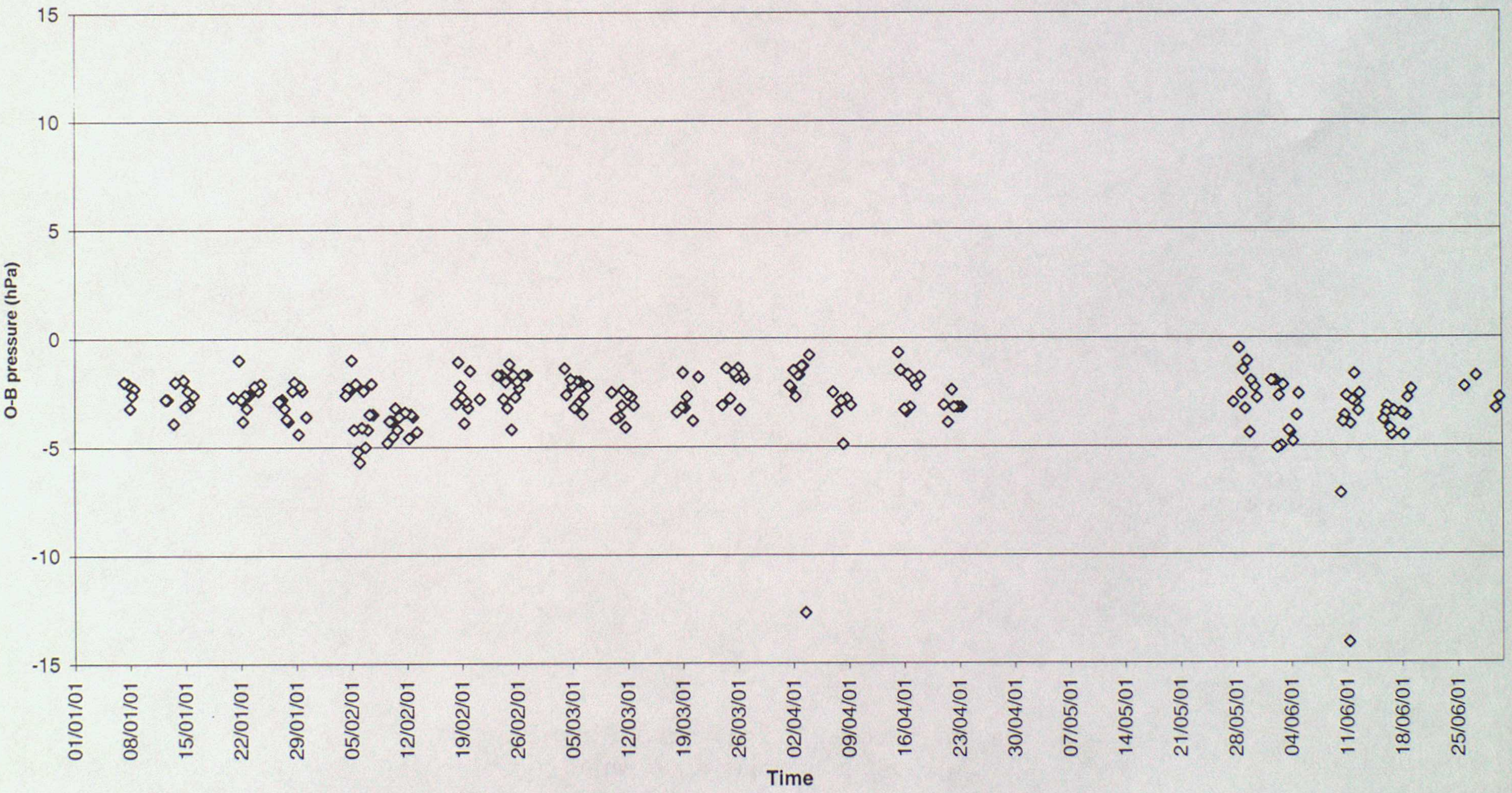
O-B pressure (hPa) for identifier H3EP
Number of obs. plotted = 133    Number of outliers = 0



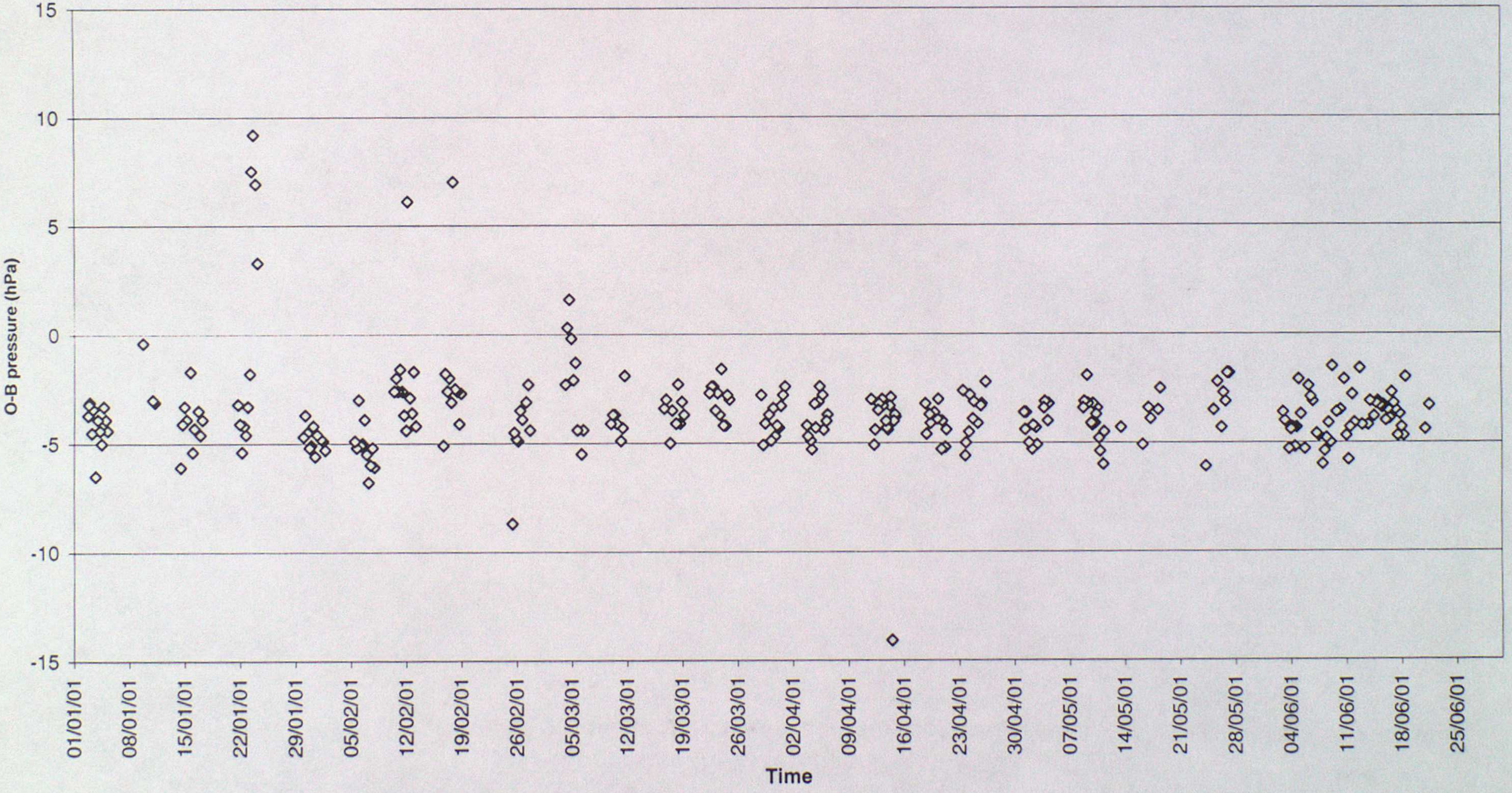
O-B pressure (hPa) for identifier KHRP
Number of obs. plotted = 232    Number of outliers = 0

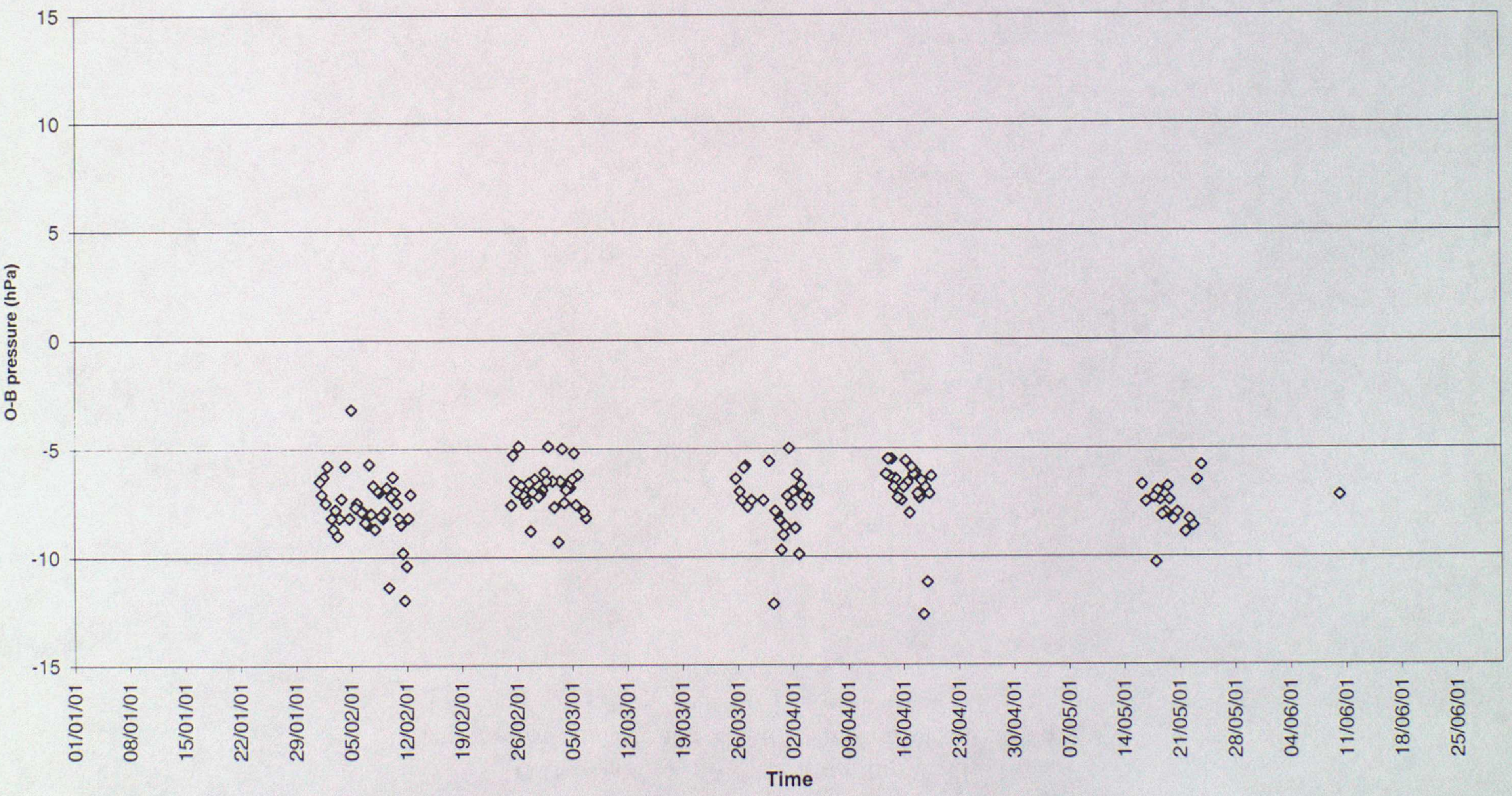


O-B pressure (hPa) for identifier KIRH
Number of obs. plotted = 199    Number of outliers = 0

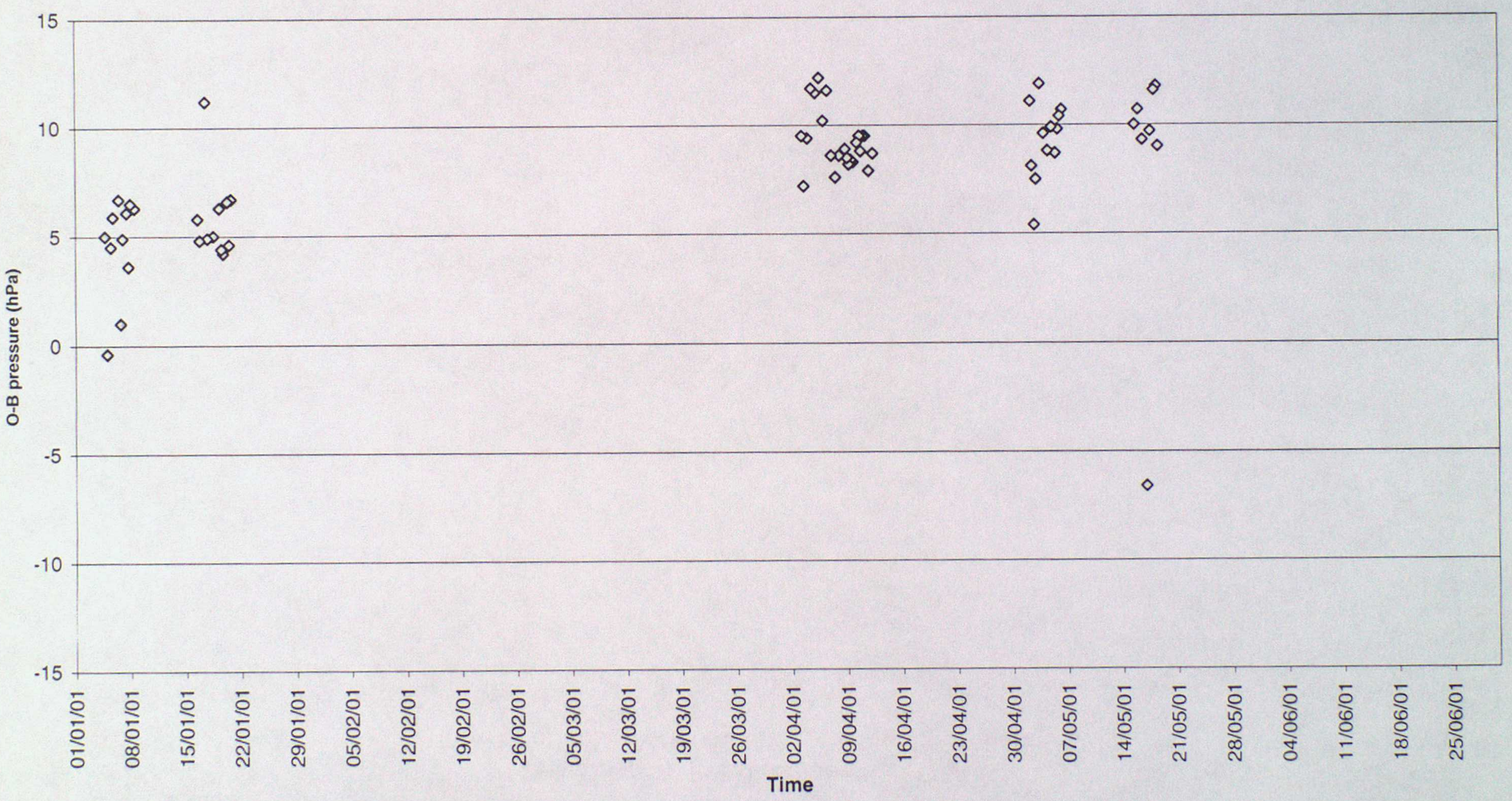


O-B pressure (hPa) for identifier KMJL
Number of obs. plotted = 280    Number of outliers = 0

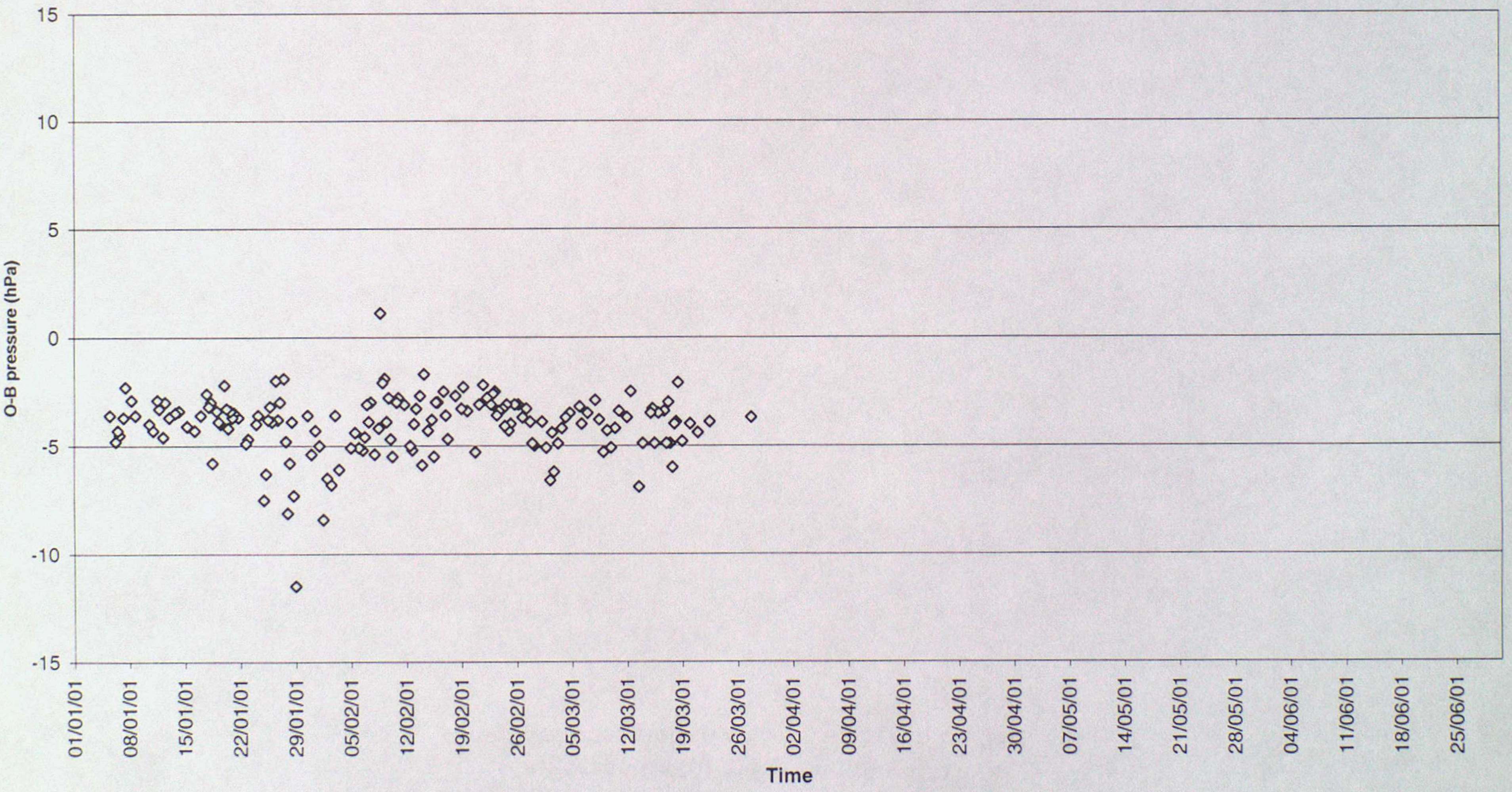



O-B pressure (hPa) for identifier LAFQ5
Number of obs. plotted = 144    Number of outliers = 4

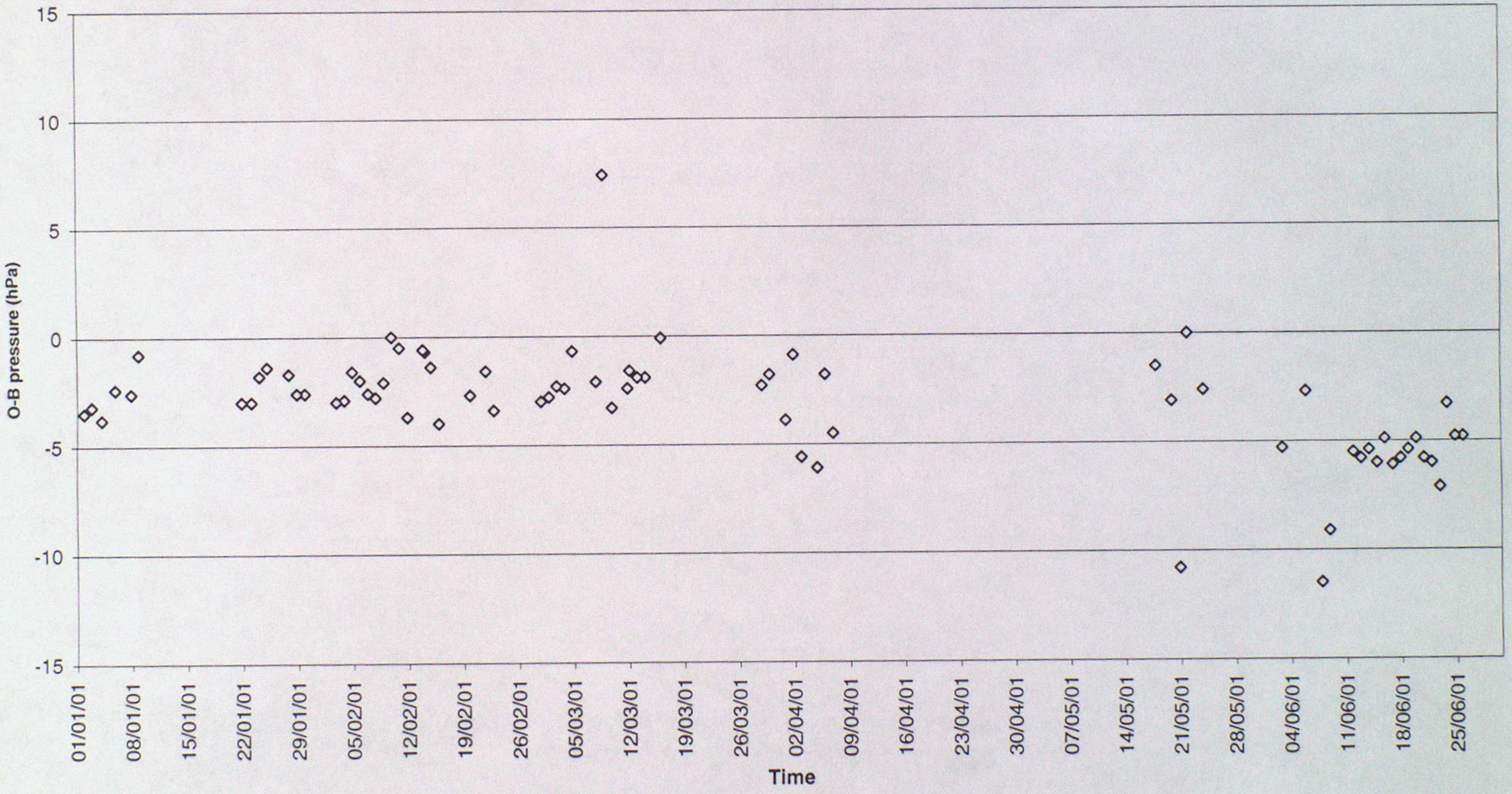
O-B pressure (hPa) for identifier LAOW5
Number of obs. plotted = 65    Number of outliers = 0



O-B pressure (hPa) for identifier OJAK
Number of obs. plotted = 162    Number of outliers = 4

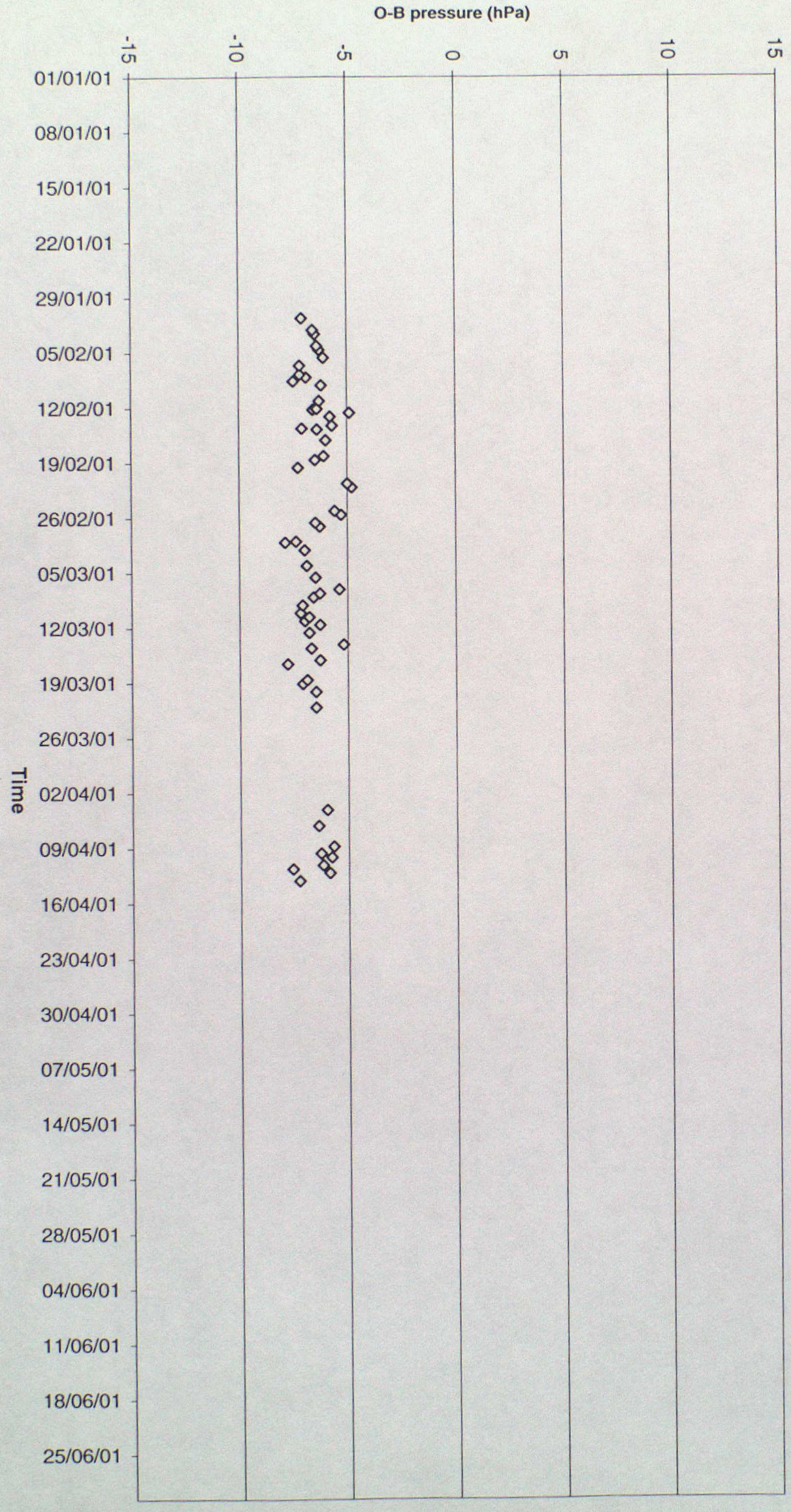


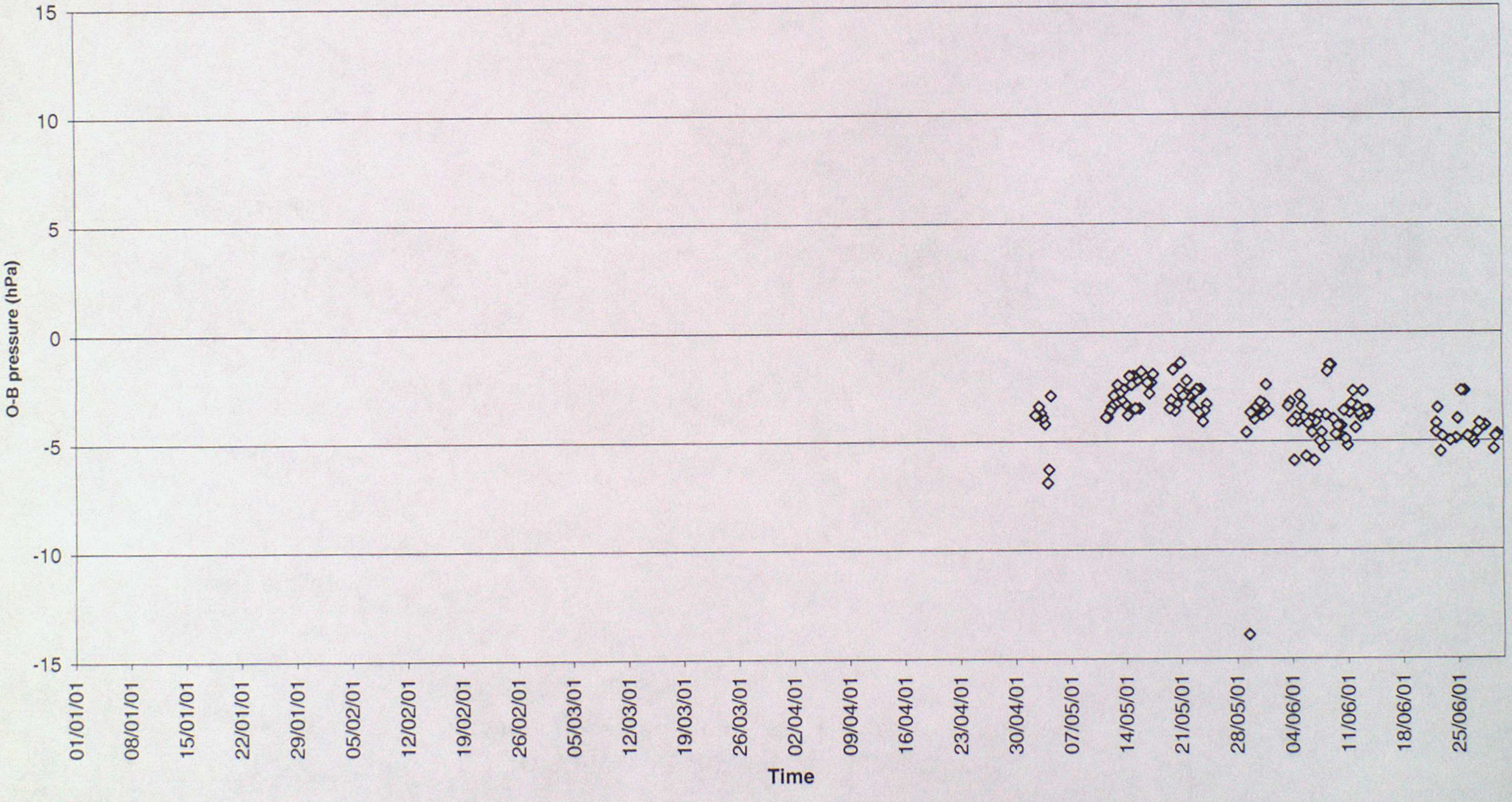
O-B pressure (hPa) for identifier OUSE6
Number of obs. plotted = 75    Number of outliers = 0



## O-B pressure (hPa) for identifier OUVZ2

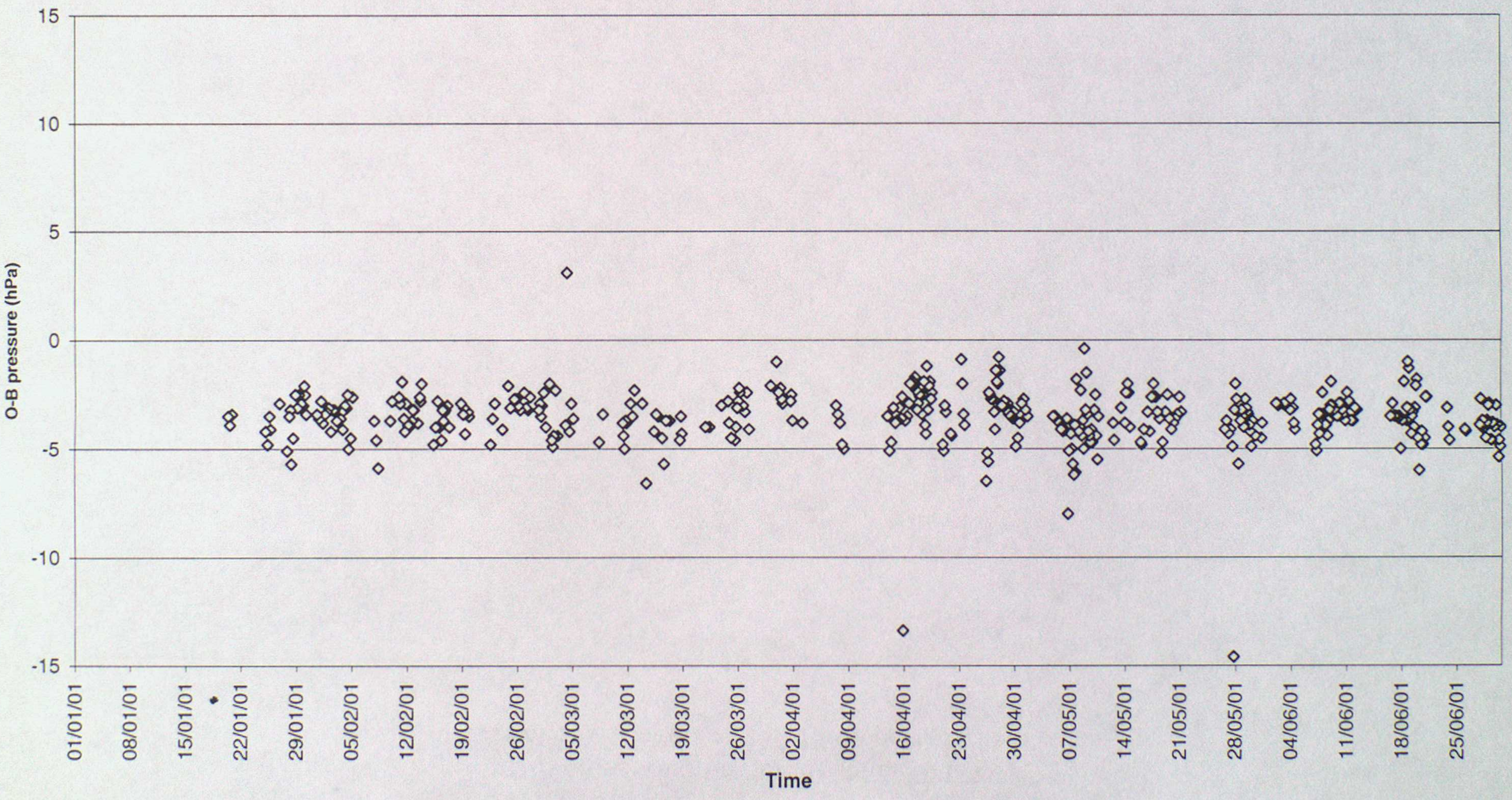
Number of obs. plotted = 60    Number of outliers = 0



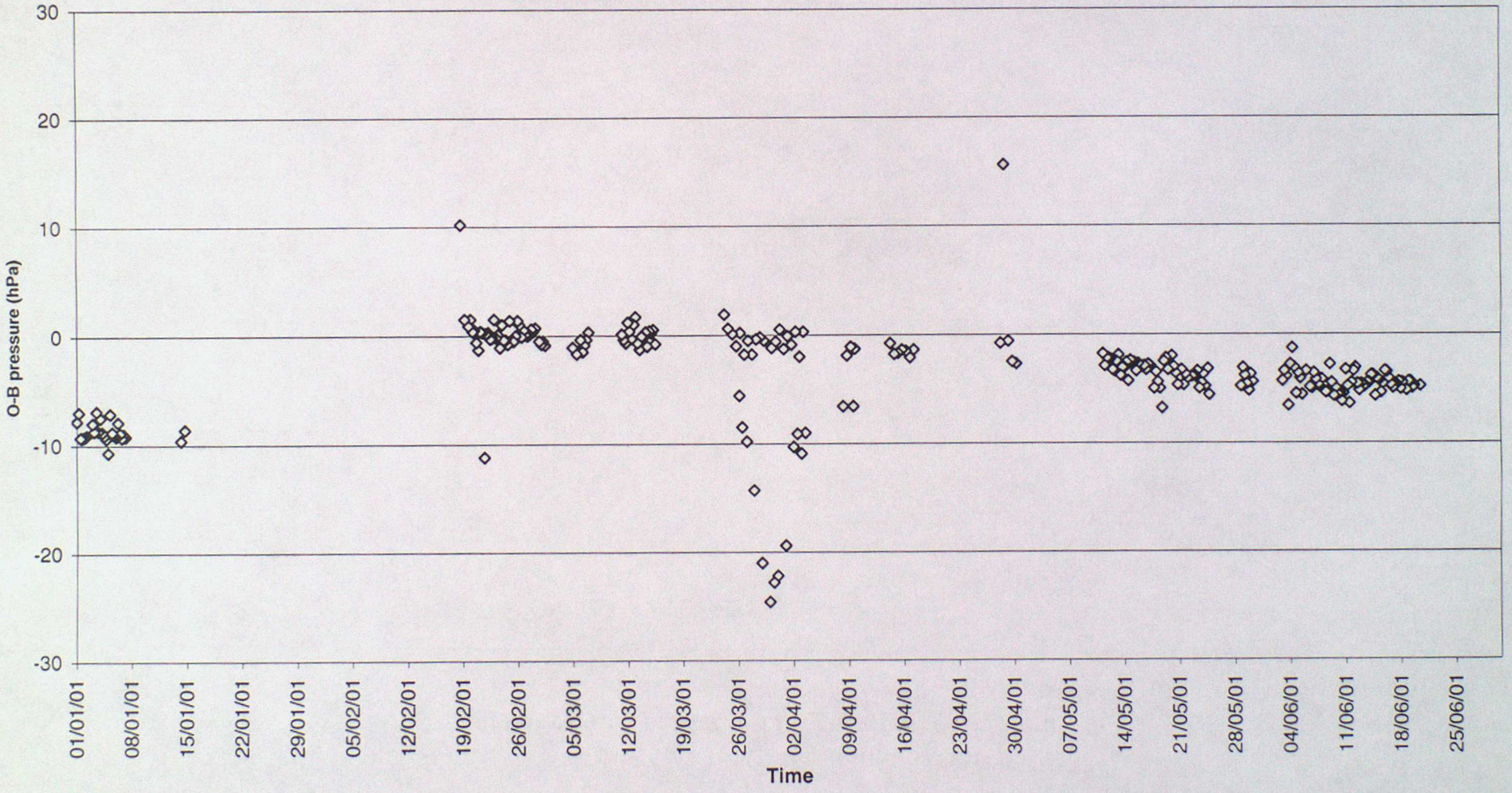


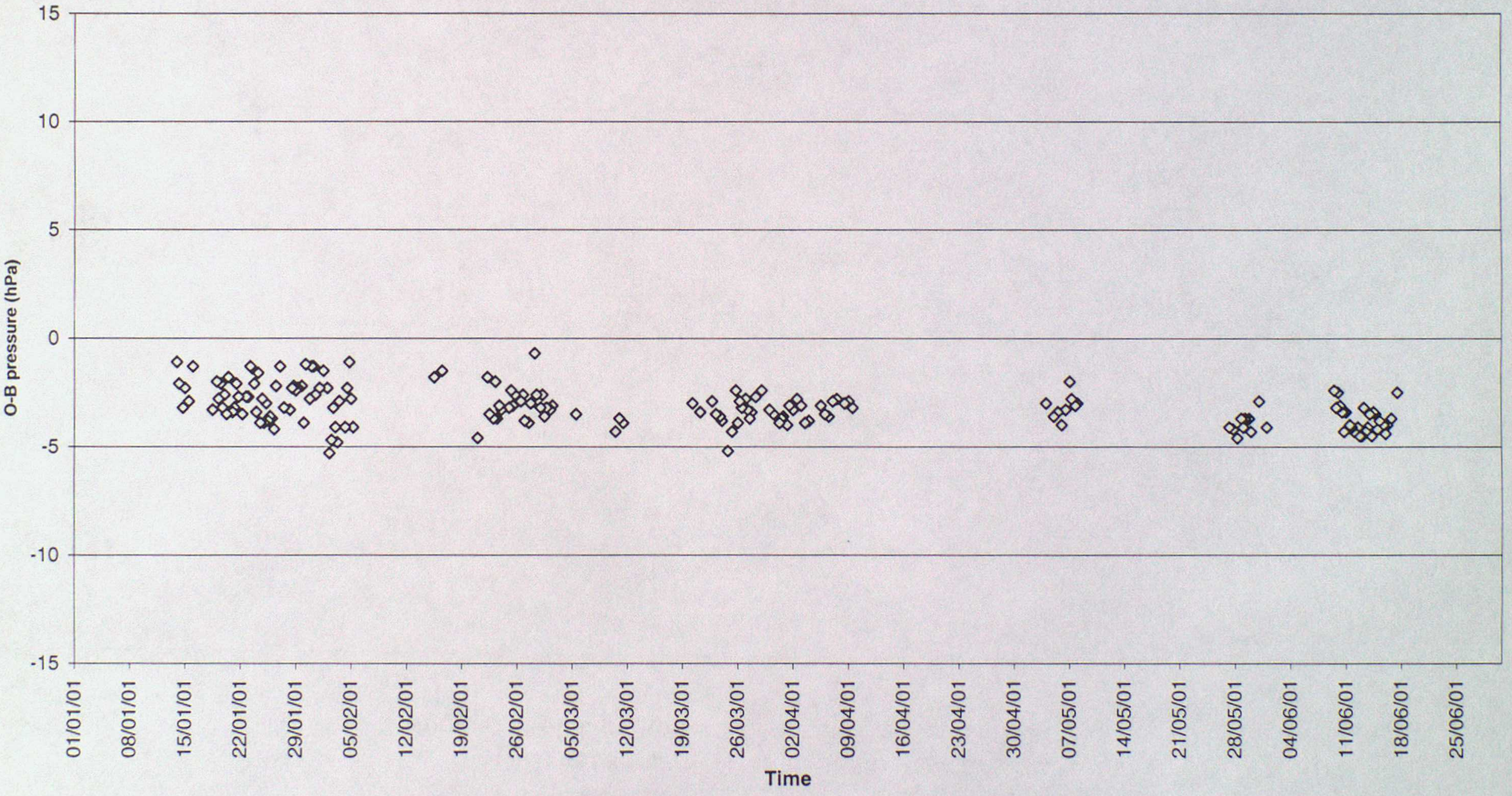
O-B pressure (hPa) for identifier OXIF2
Number of obs. plotted = 128    Number of outliers = 0

O-B pressure (hPa) for identifier OXYH2
Number of obs. plotted = 428    Number of outliers = 0

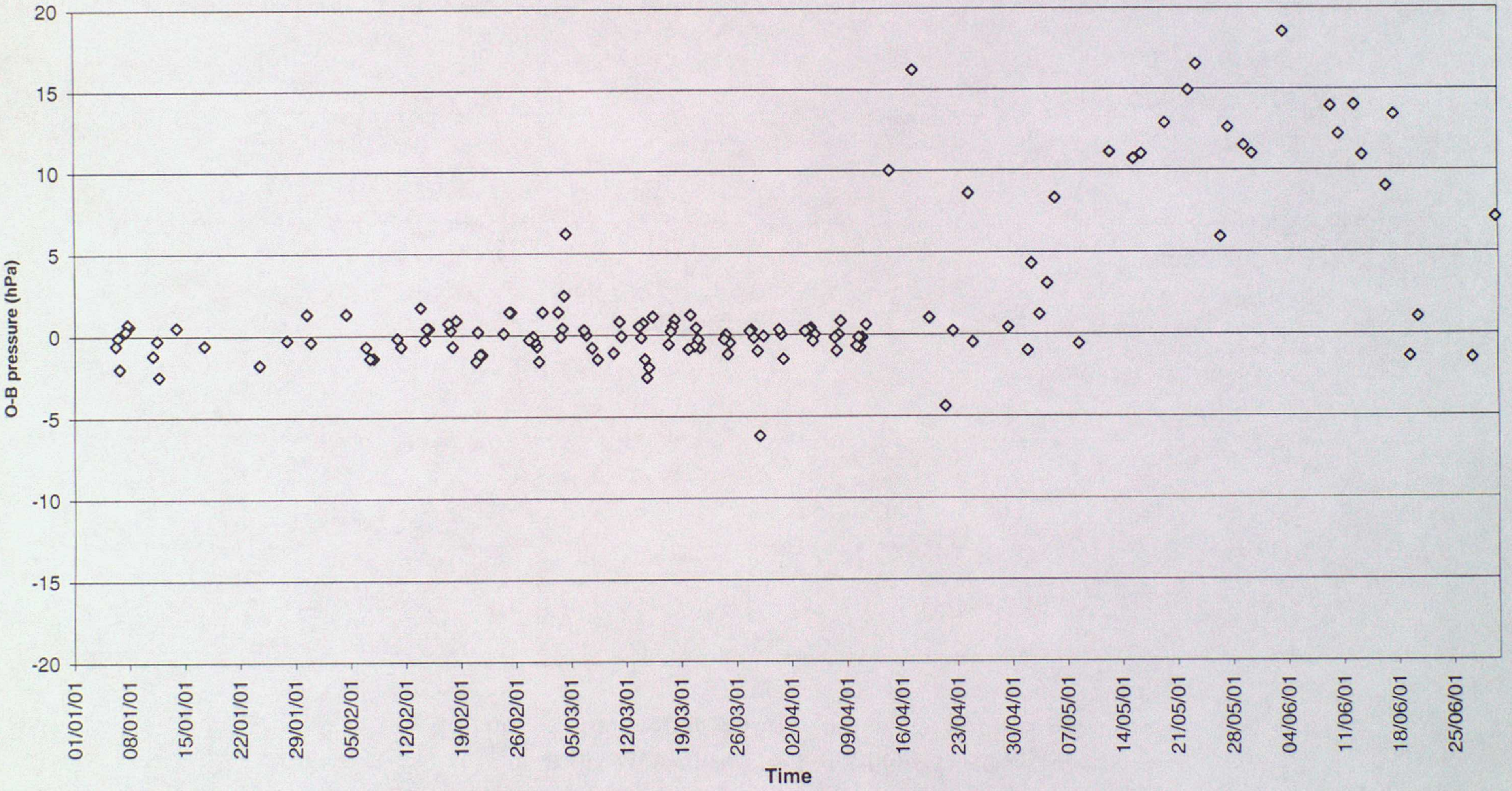


O-B pressure (hPa) for identifier PCAG
Number of obs. plotted = 261    Number of outliers = 0

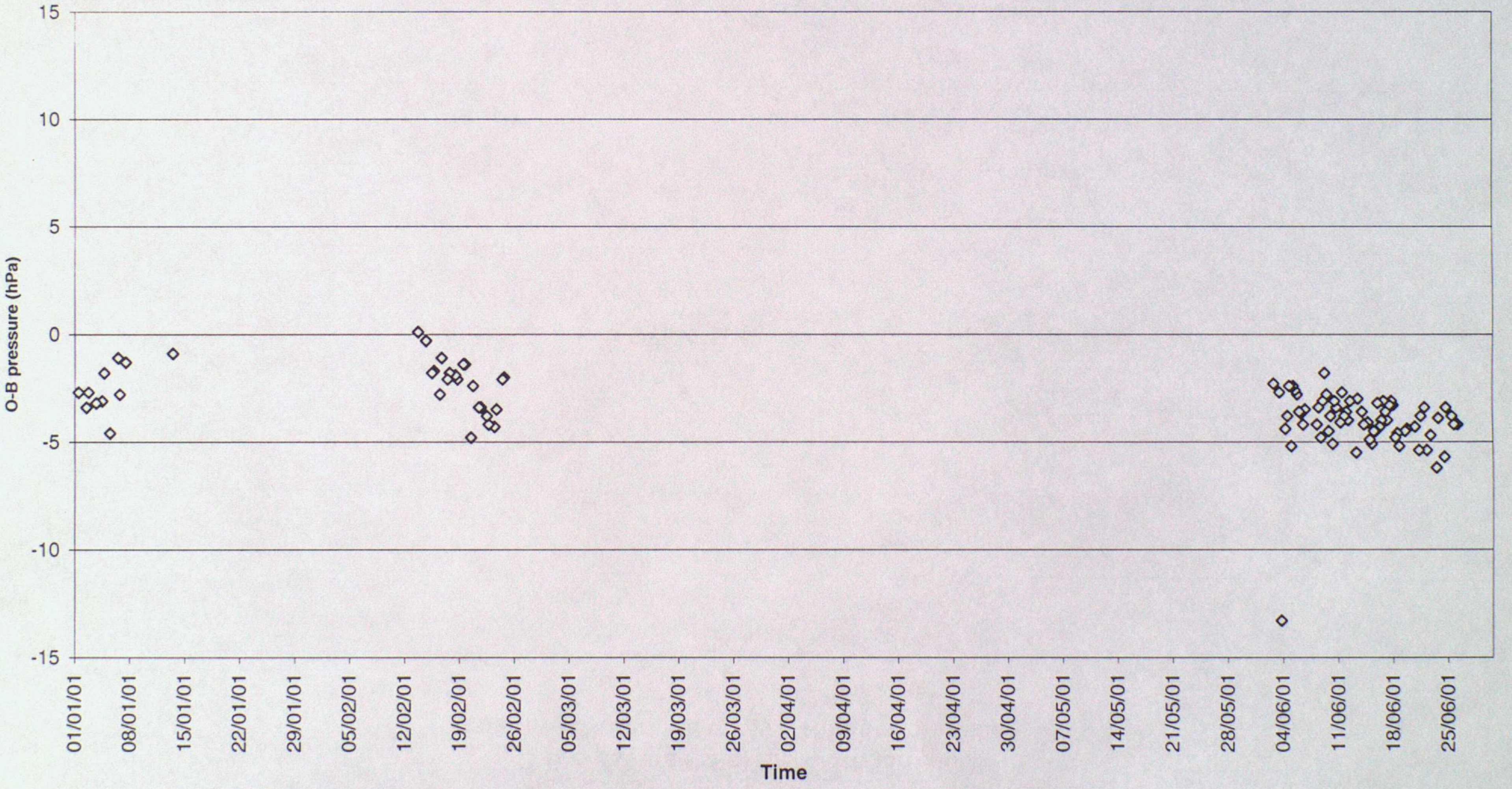



O-B pressure (hPa) for identifier PDBY
Number of obs. plotted = 178    Number of outliers = 0

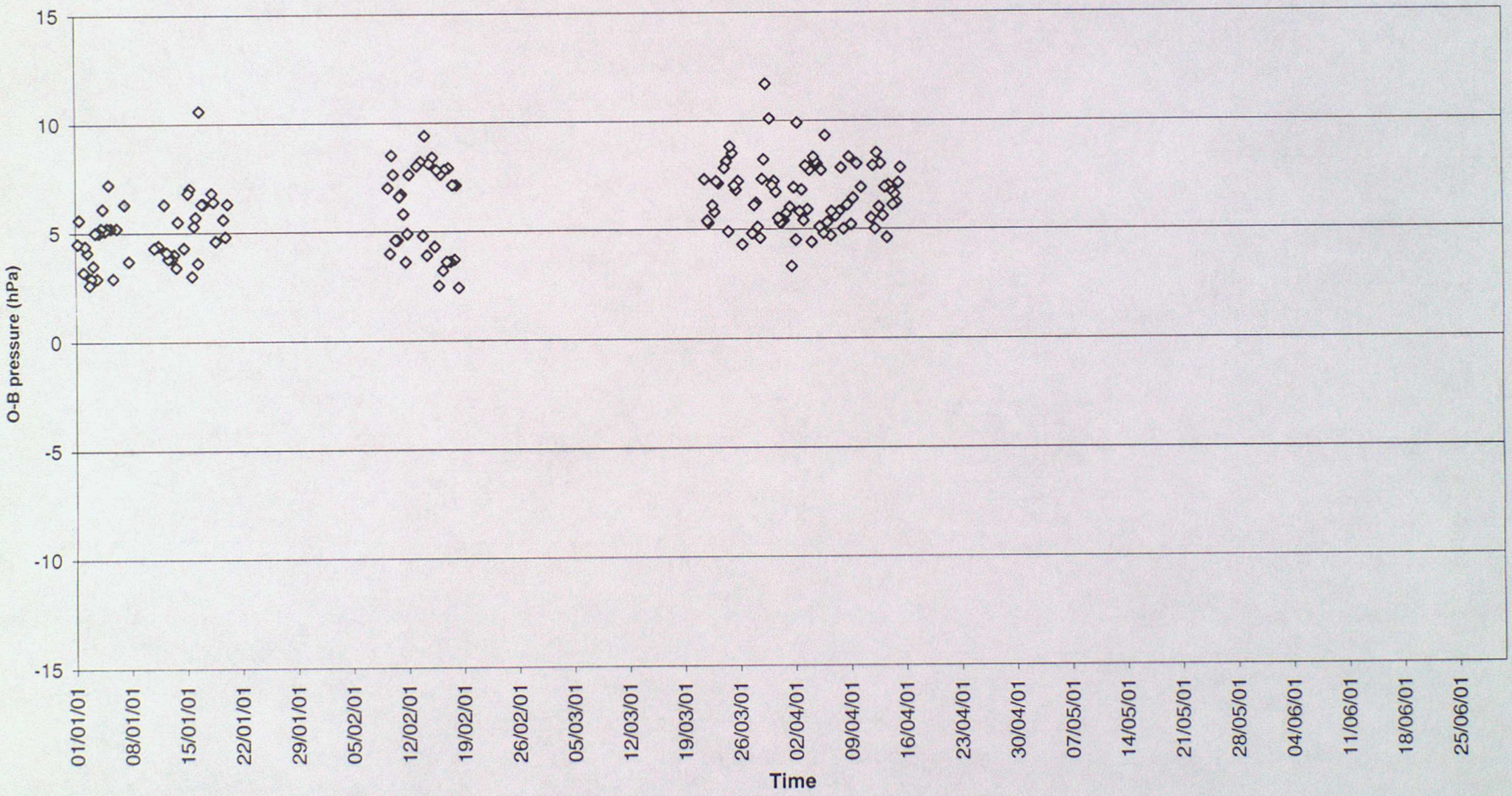
O-B pressure (hPa) for identifier PJJU
Number of obs. plotted = 133    Number of outliers = 0



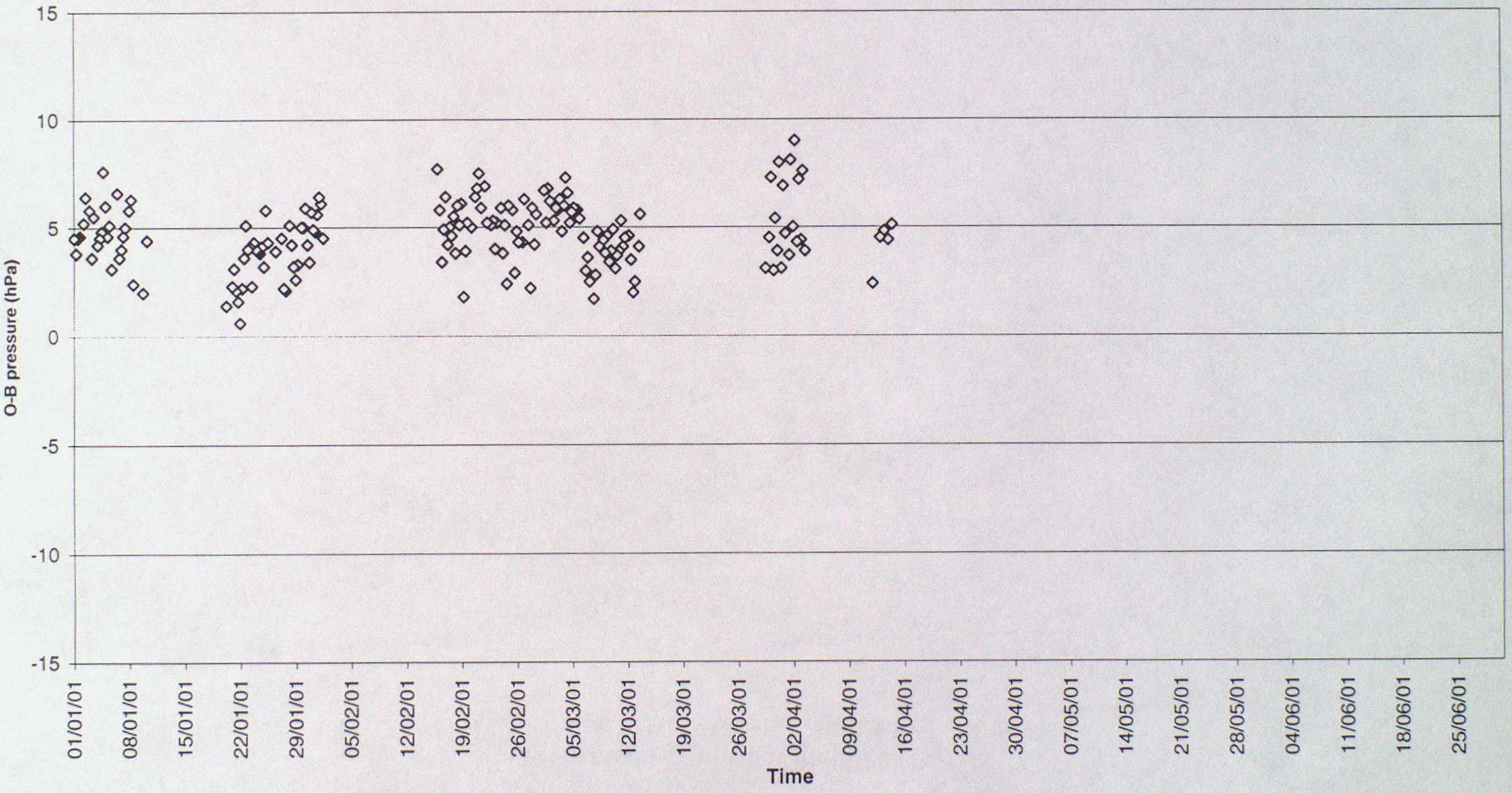
O-B pressure (hPa) for identifier P3NB5
Number of obs. plotted = 100    Number of outliers = 0

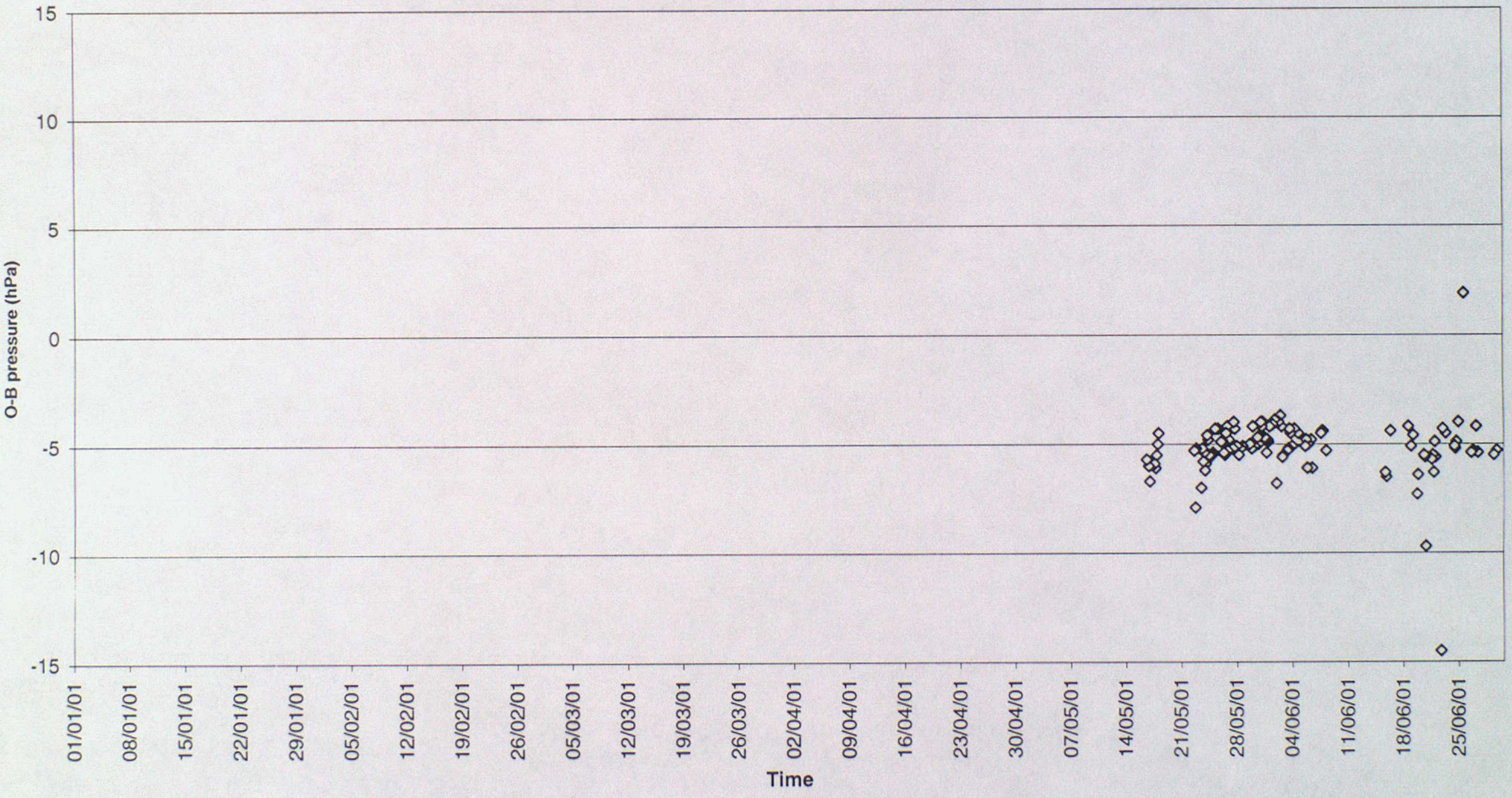


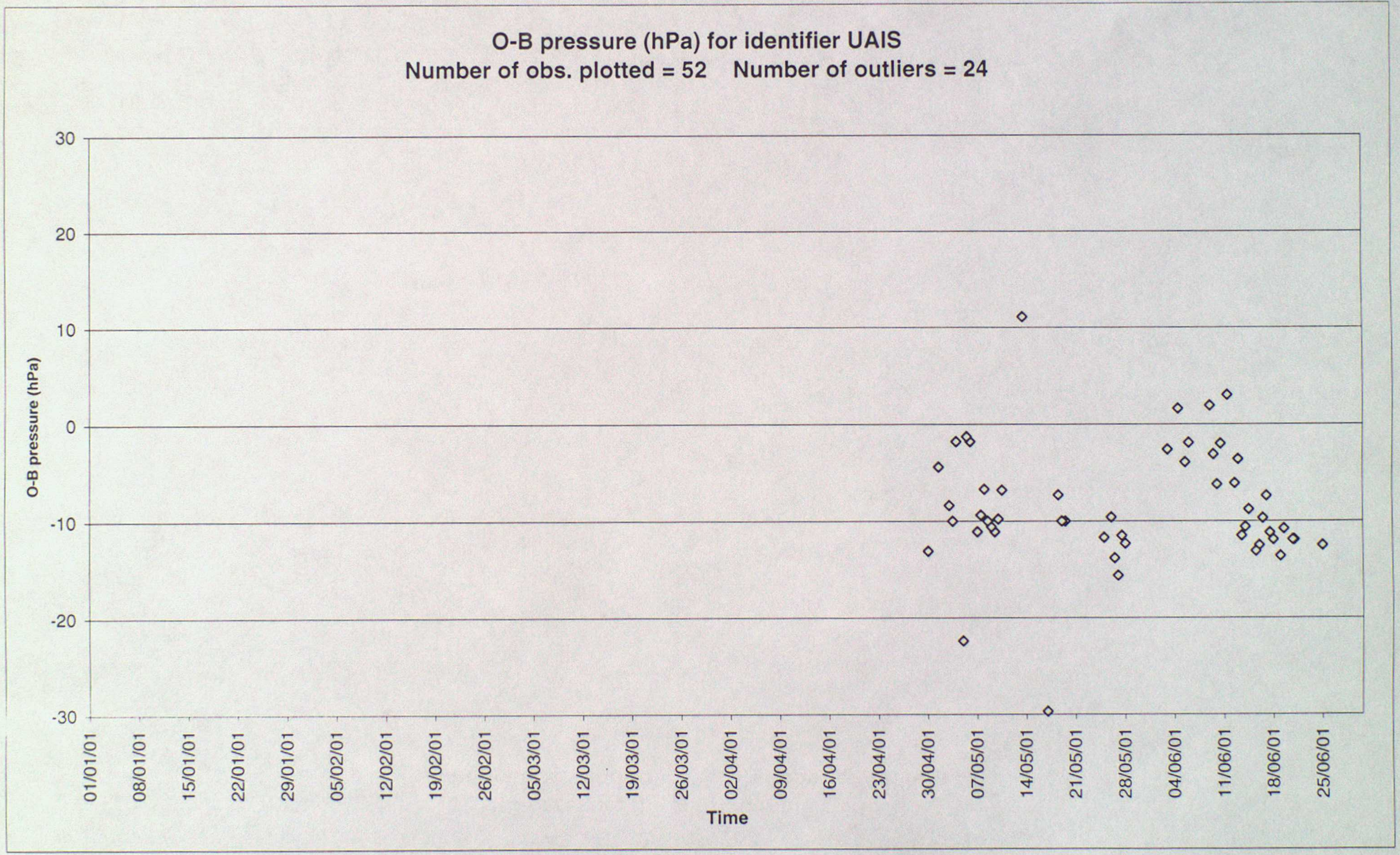
O-B pressure (hPa) for identifier P3YR5
Number of obs. plotted = 159    Number of outliers = 1



O-B pressure (hPa) for identifier P3YS5
Number of obs. plotted = 179    Number of outliers = 0

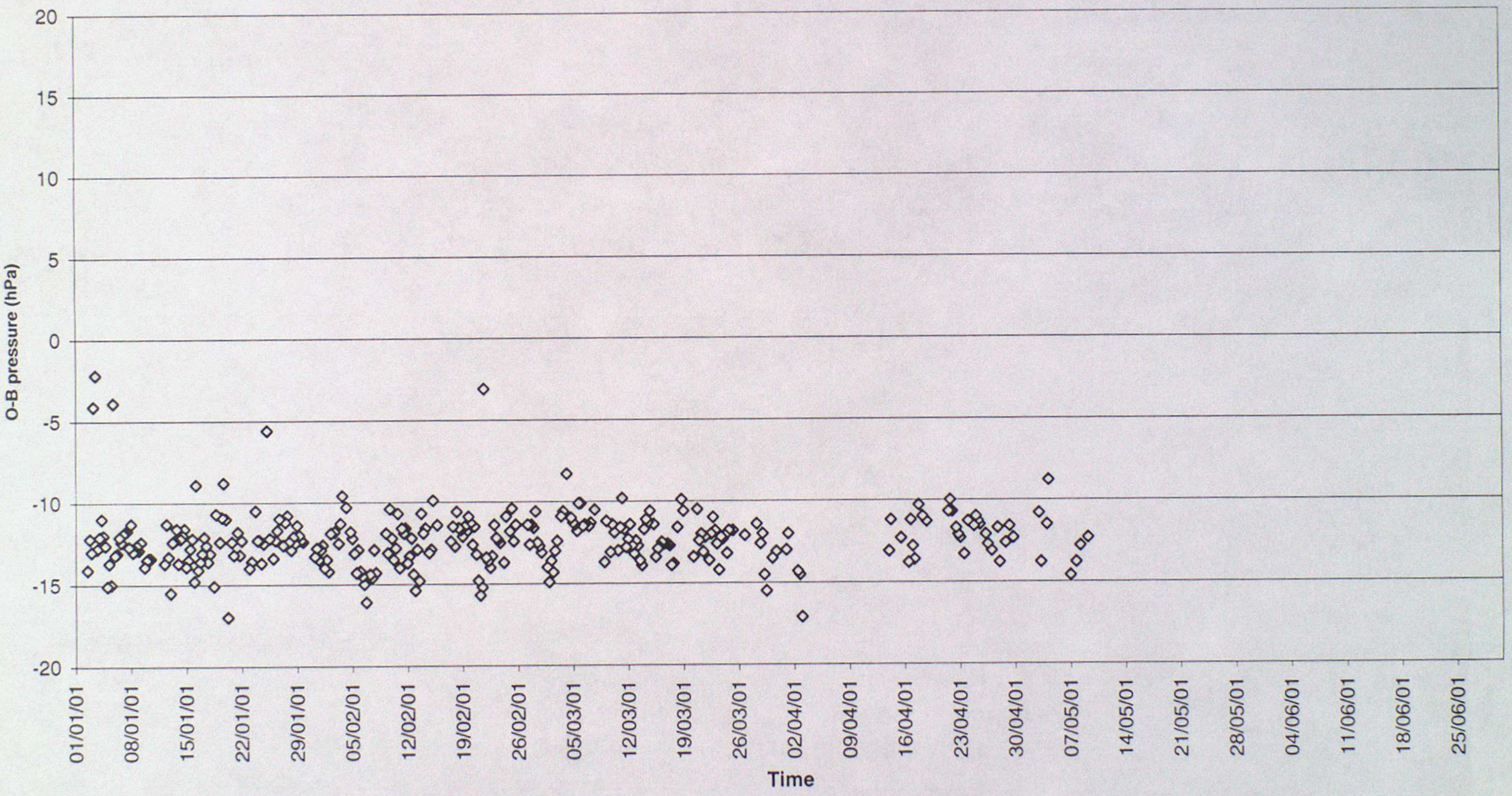


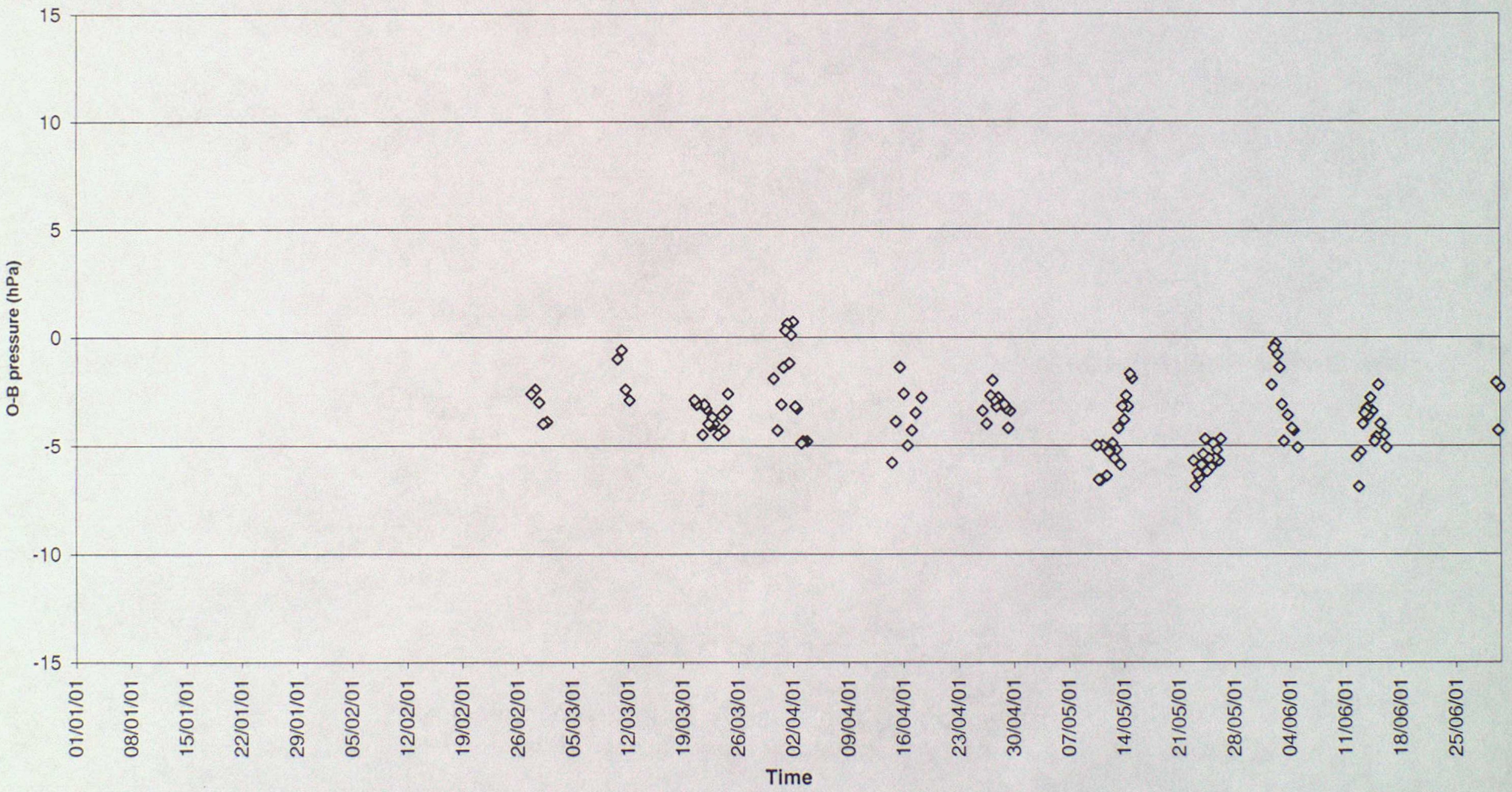

O-B pressure (hPa) for identifier SK000
Number of obs. plotted = 112    Number of outliers = 0



O-B pressure (hPa) for identifier UAIS
Number of obs. plotted = 52    Number of outliers = 24

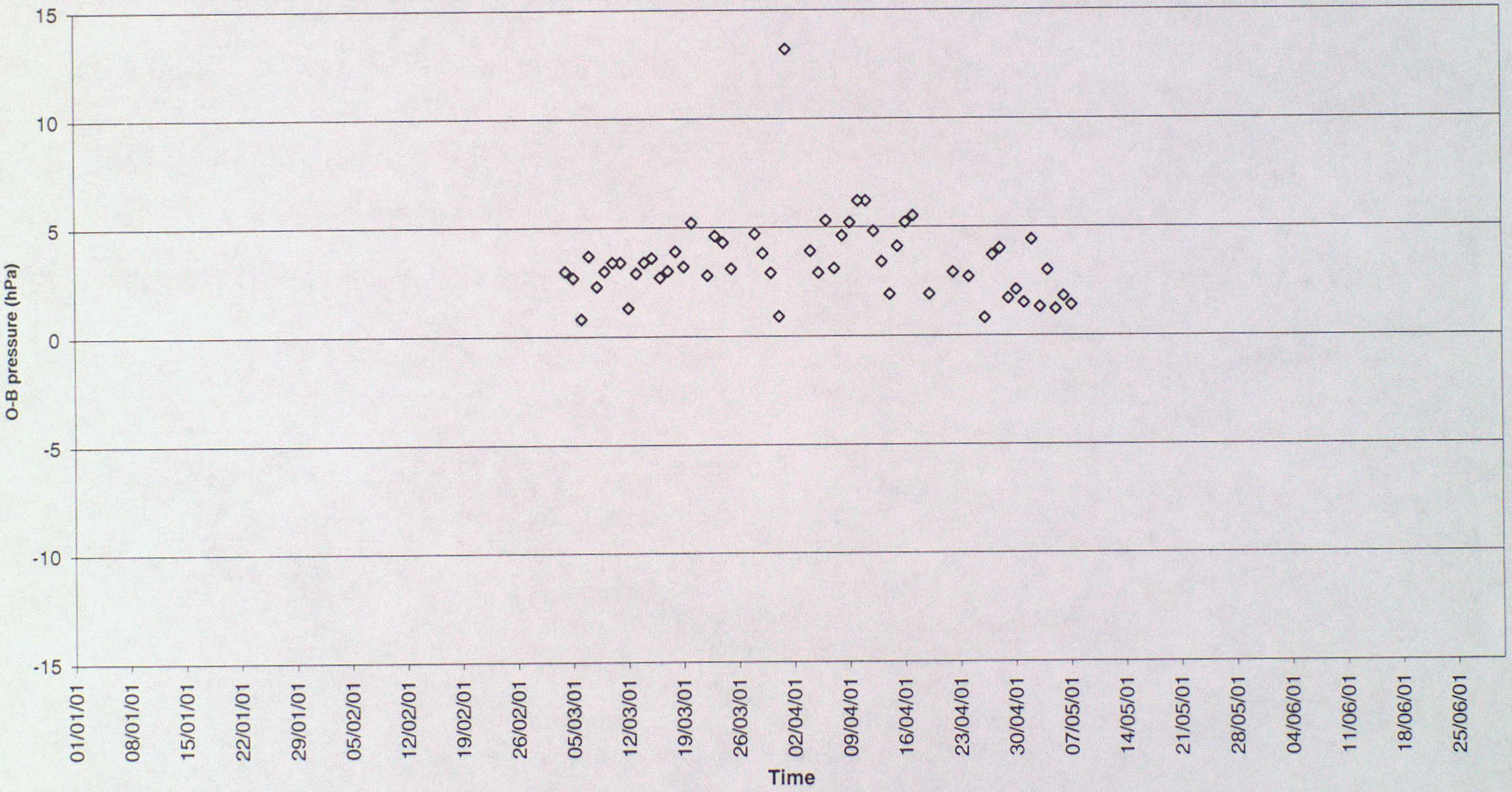
O-B pressure (hPa) for identifier UAMR
Number of obs. plotted = 308    Number of outliers = 4



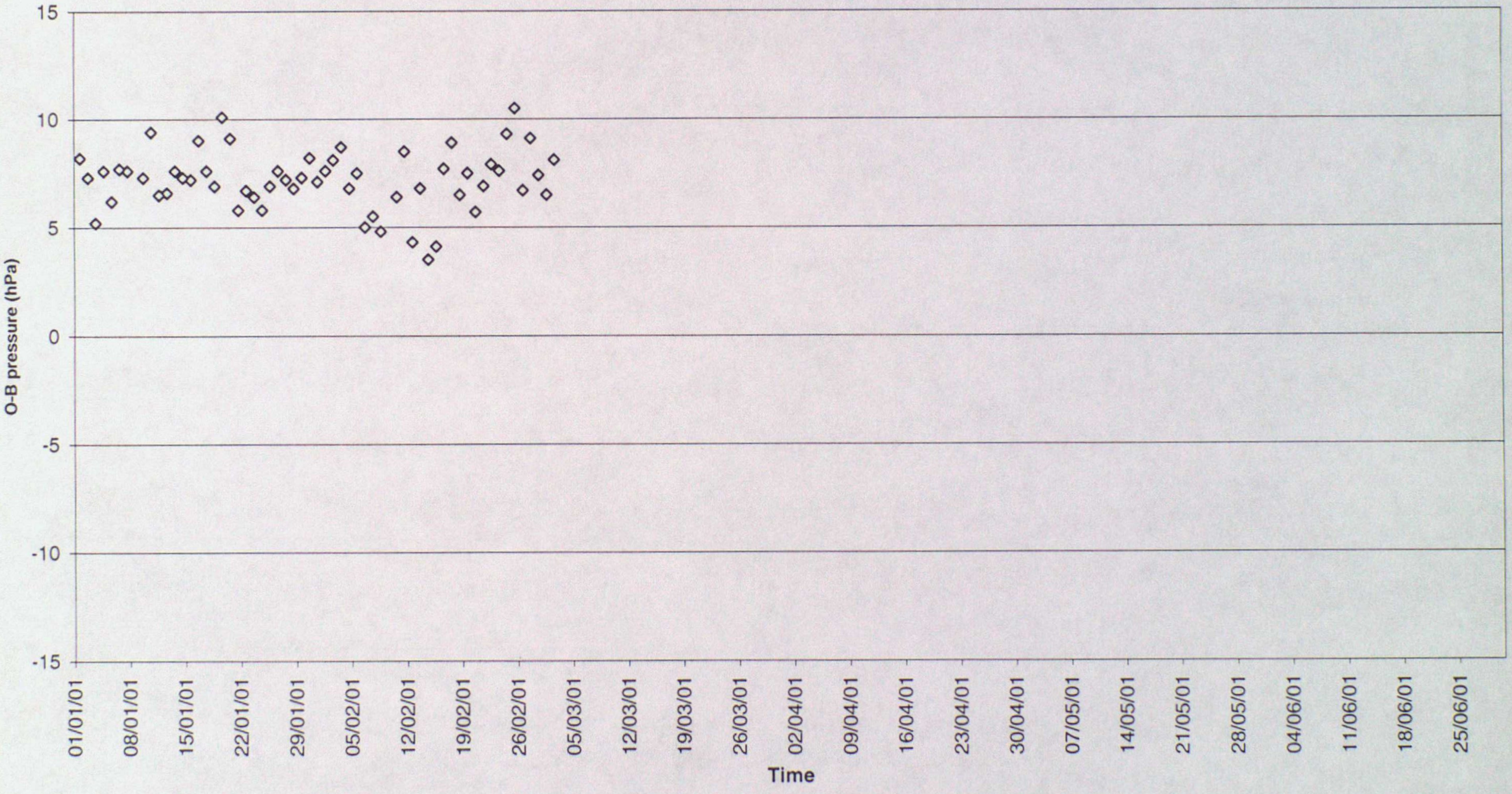


O-B pressure (hPa) for identifier UANF
Number of obs. plotted = 118    Number of outliers = 0

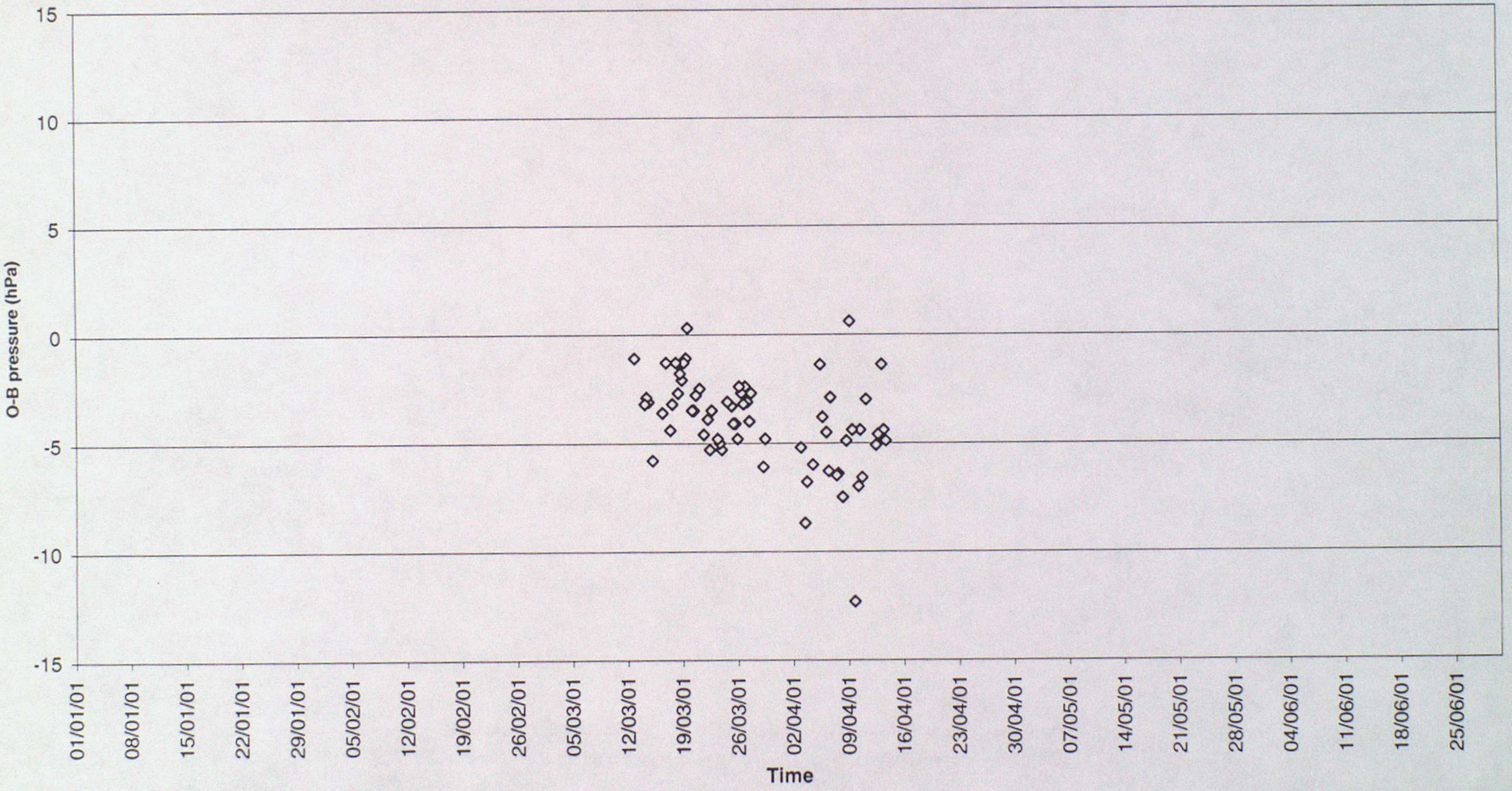
O-B pressure (hPa) for identifier UASP
Number of obs. plotted = 55    Number of outliers = 0

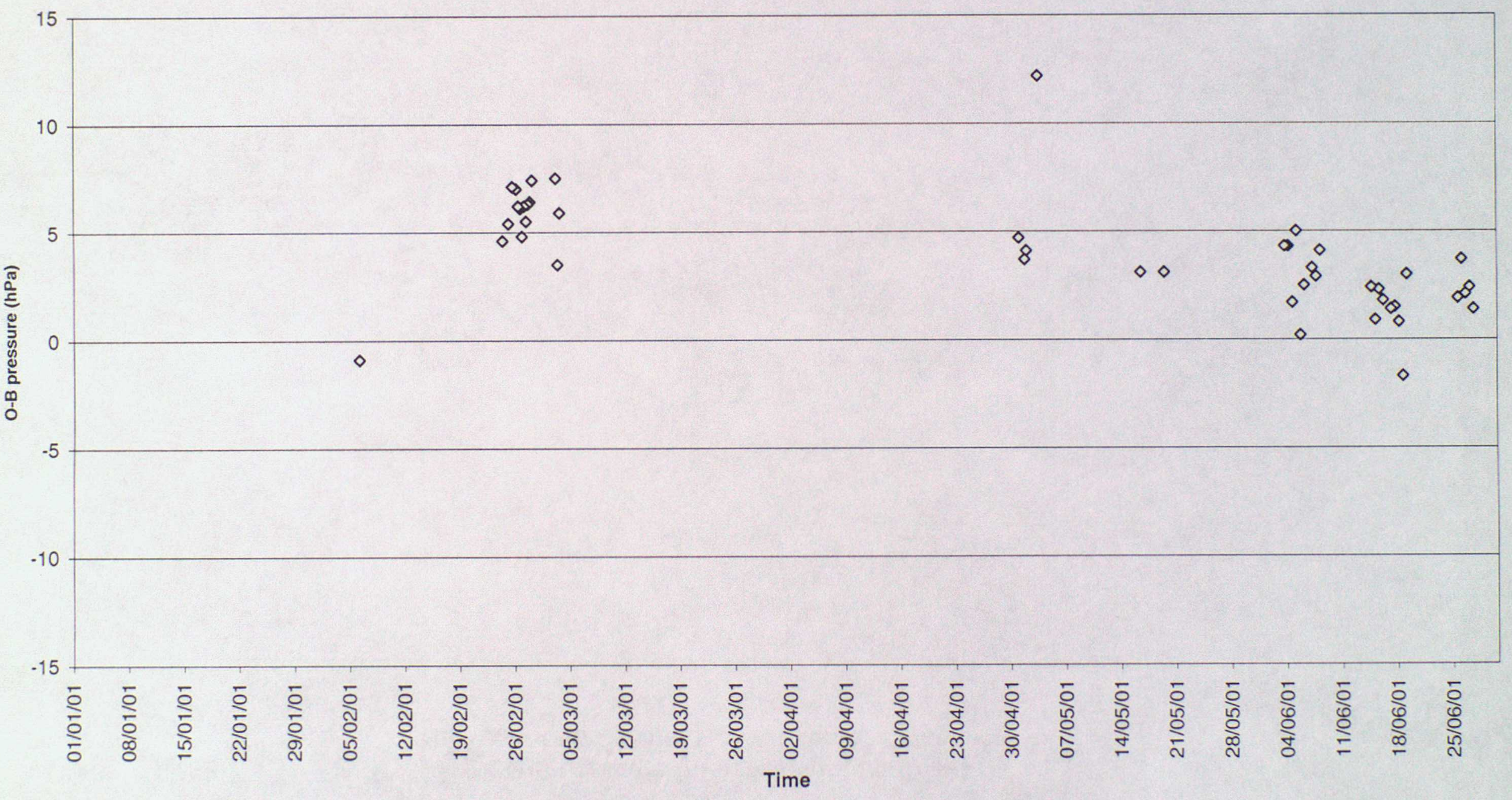


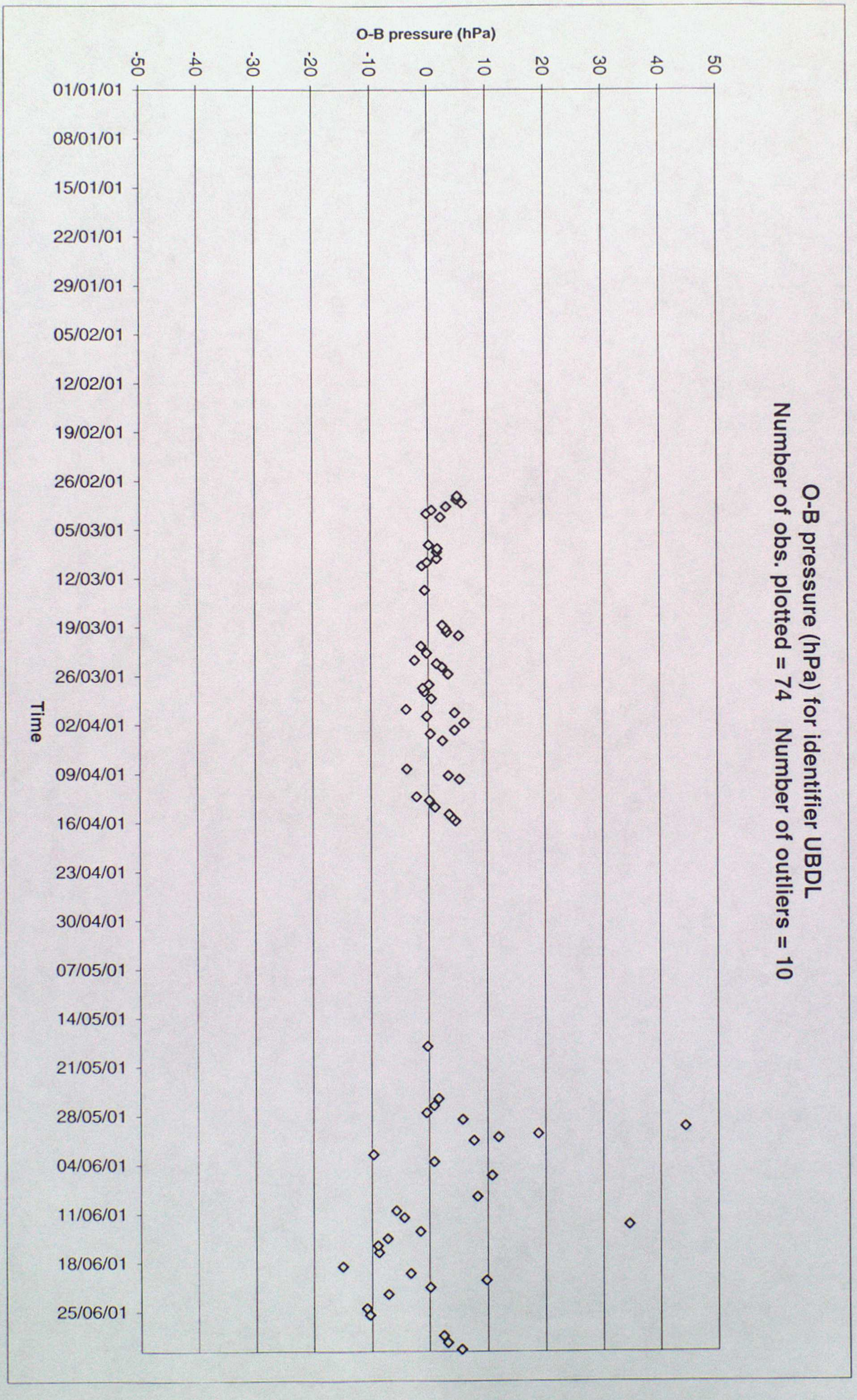
O-B pressure (hPa) for identifier UASX
Number of obs. plotted = 59    Number of outliers = 0



O-B pressure (hPa) for identifier UBAU
Number of obs. plotted = 66    Number of outliers = 0

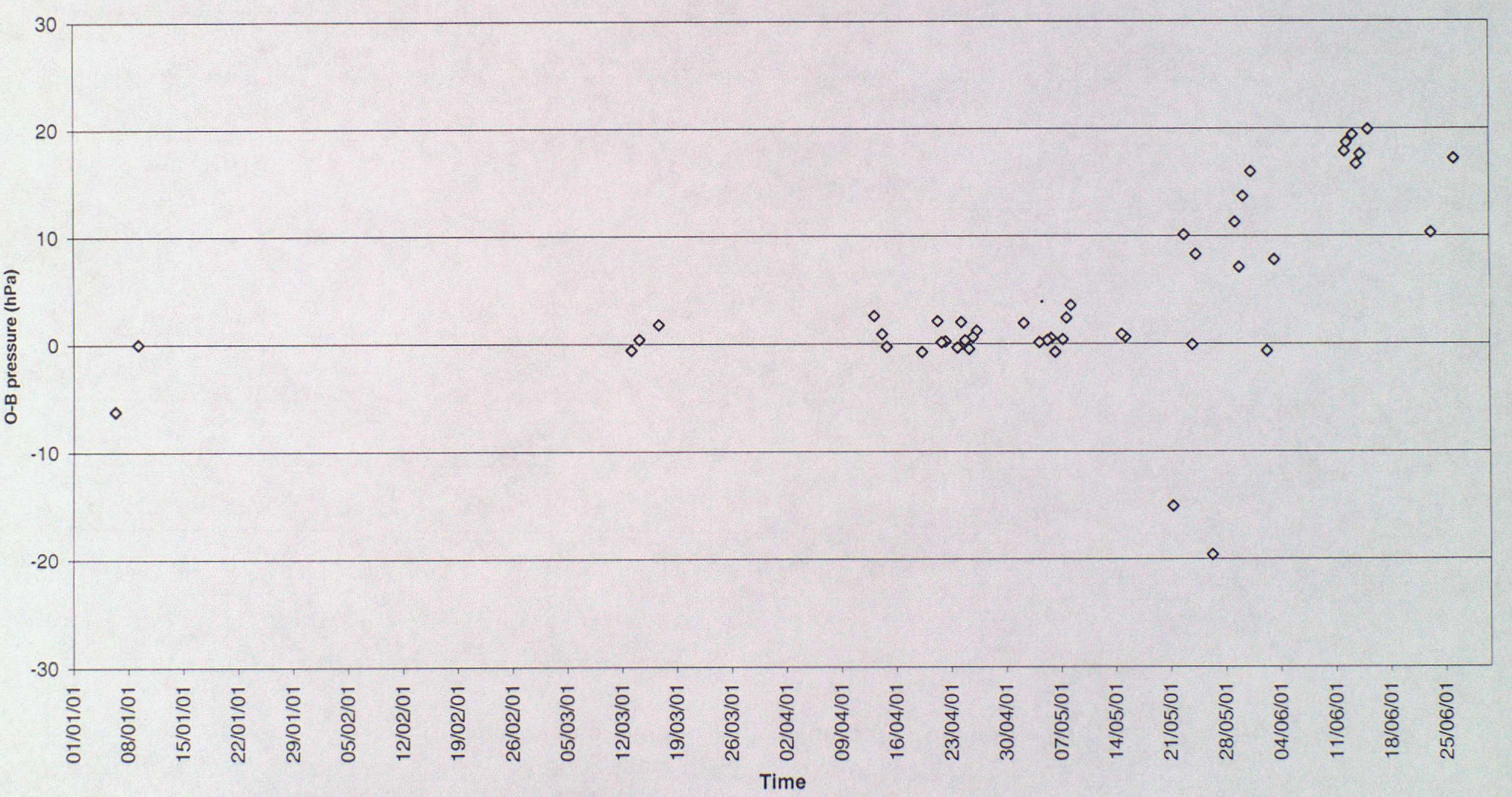



O-B pressure (hPa) for identifier UBDA
Number of obs. plotted = 45    Number of outliers = 0



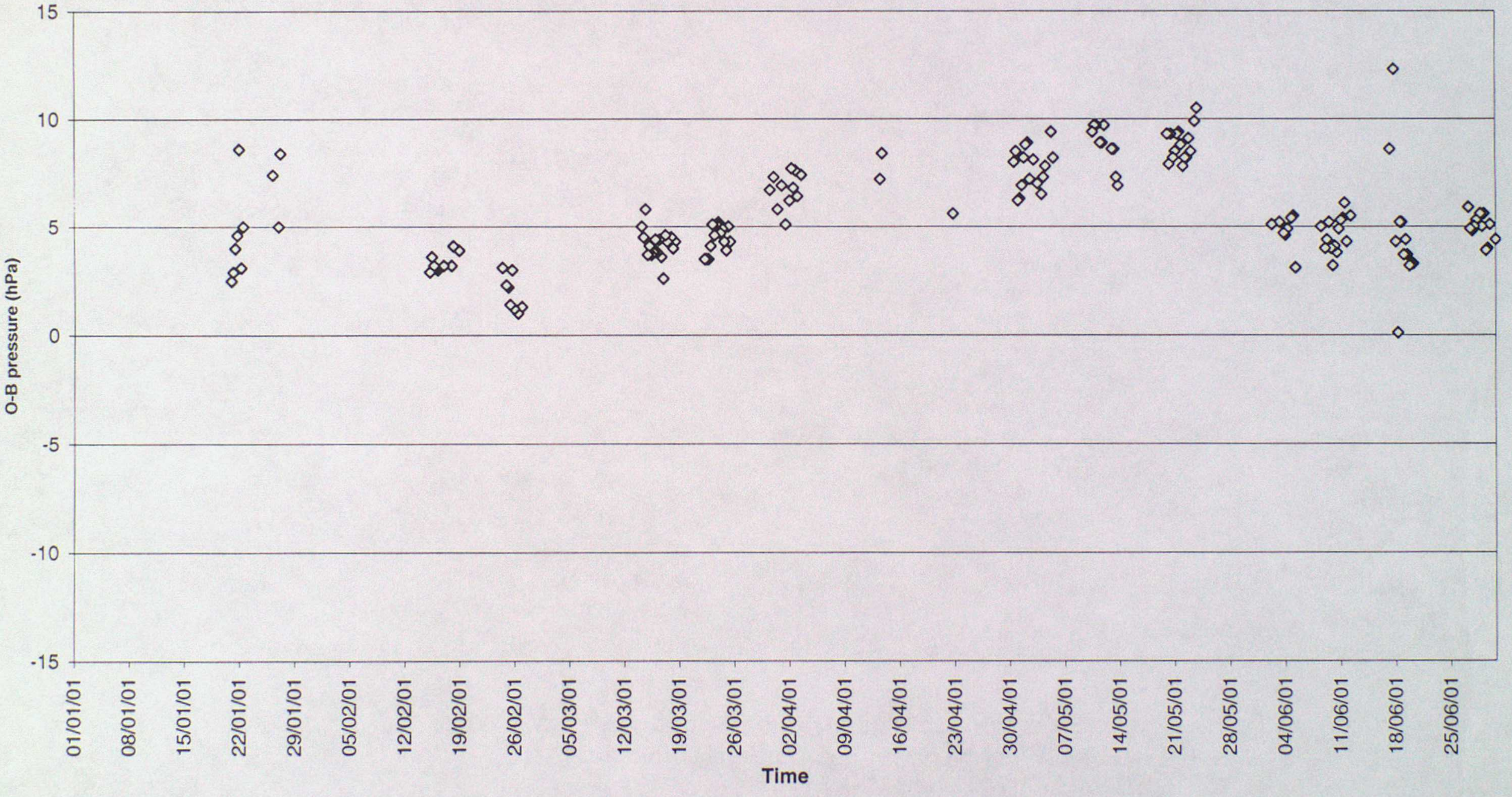
O-B pressure (hPa) for identifier UBDL

Number of obs. plotted = 74 Number of outliers = 10

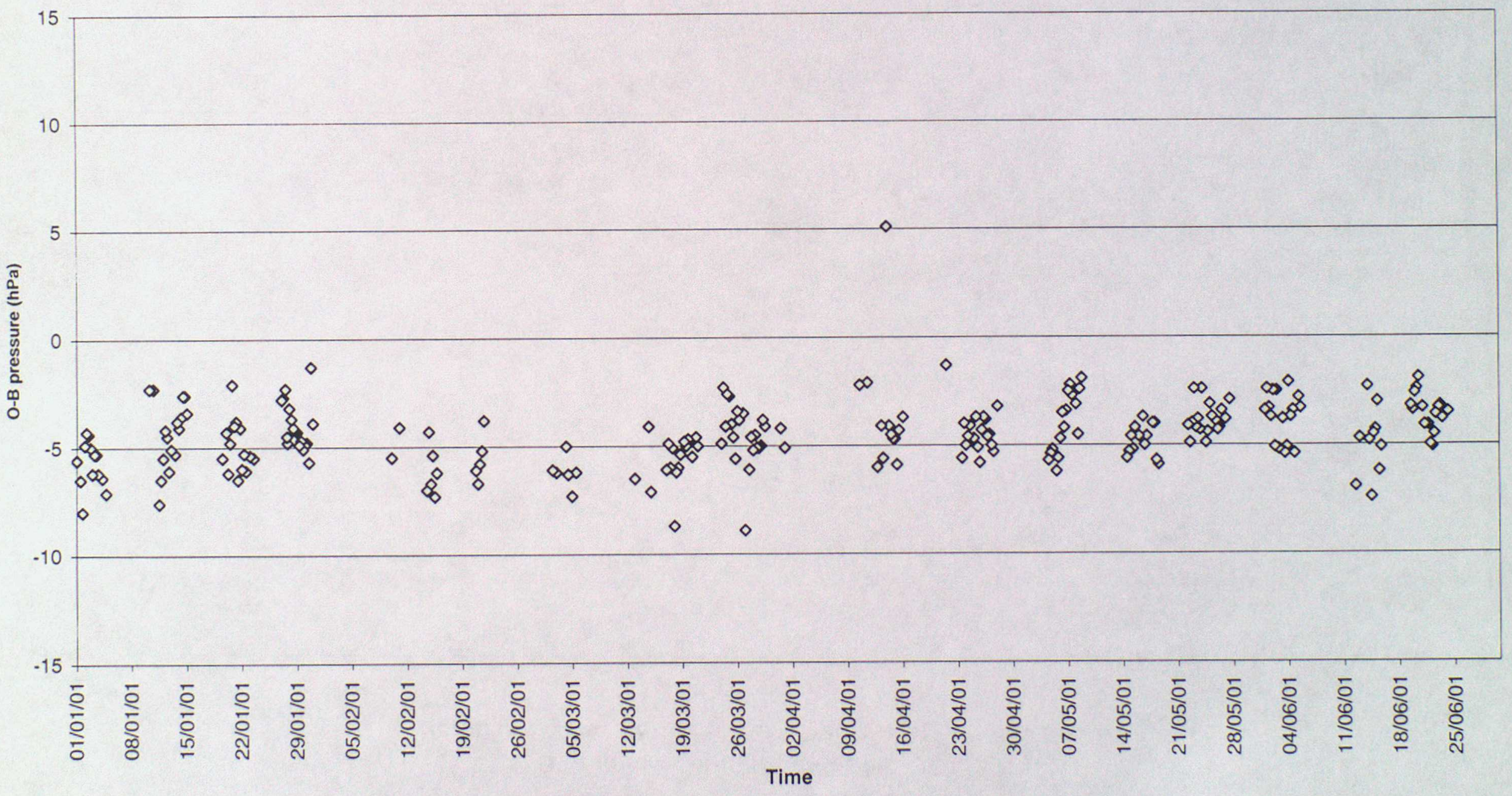


O-B pressure (hPa) for identifier UBDP
Number of obs. plotted = 47    Number of outliers = 0

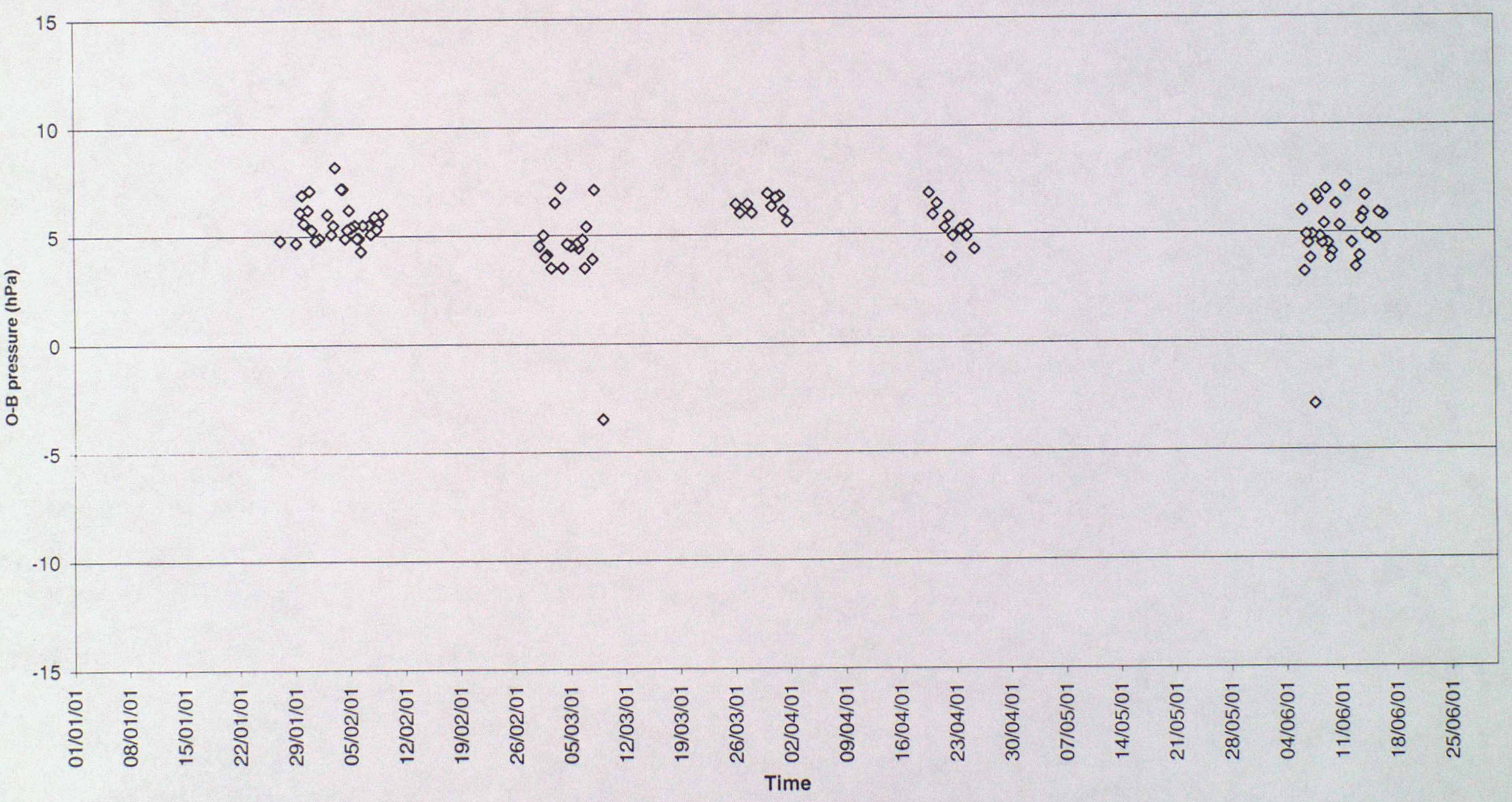
O-B pressure (hPa) for identifier UCAC
Number of obs. plotted = 159    Number of outliers = 0

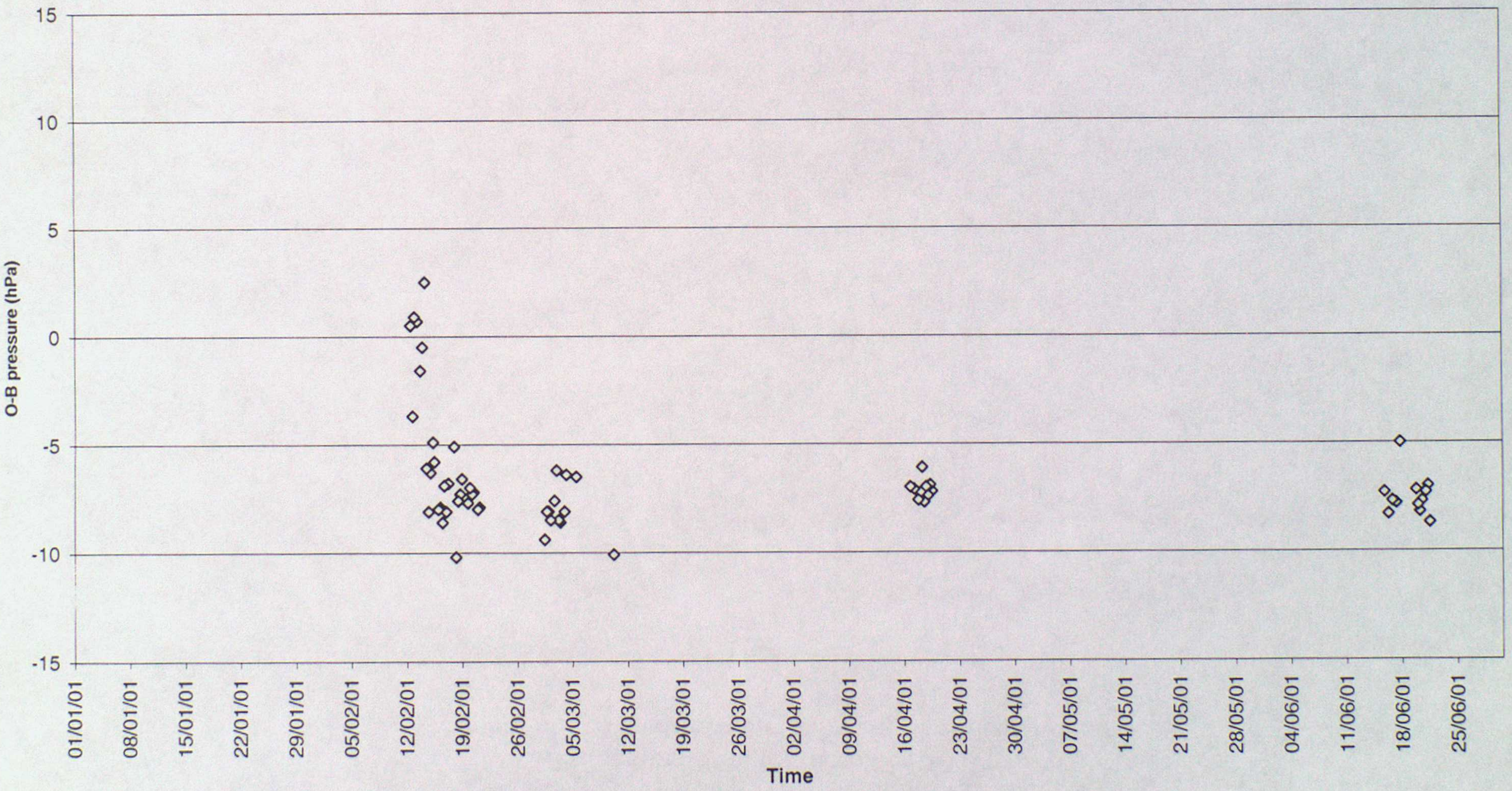


O-B pressure (hPa) for identifier UCJB
Number of obs. plotted = 242    Number of outliers = 5



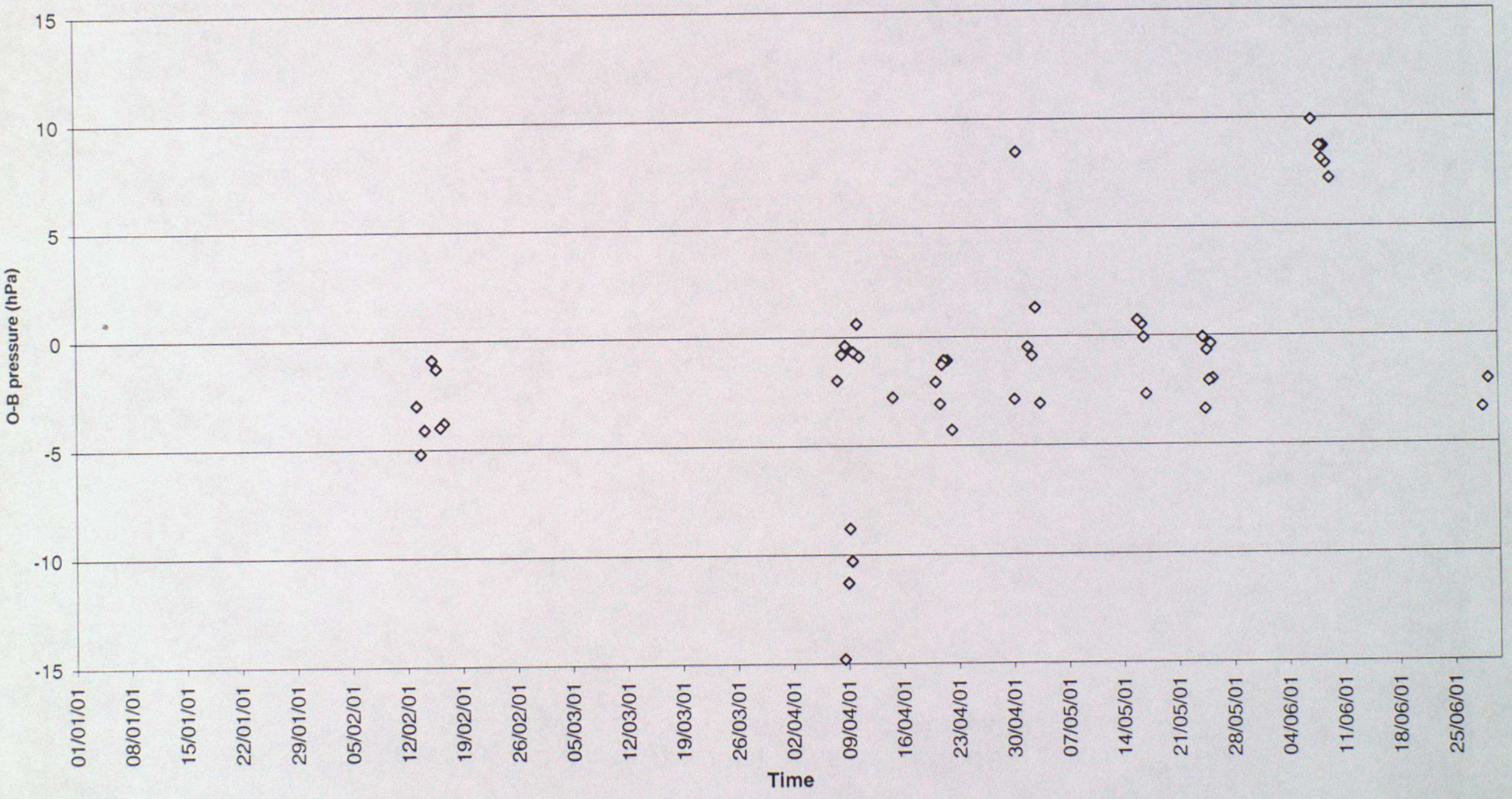
O-B pressure (hPa) for identifier UCJL
Number of obs. plotted = 99    Number of outliers = 0

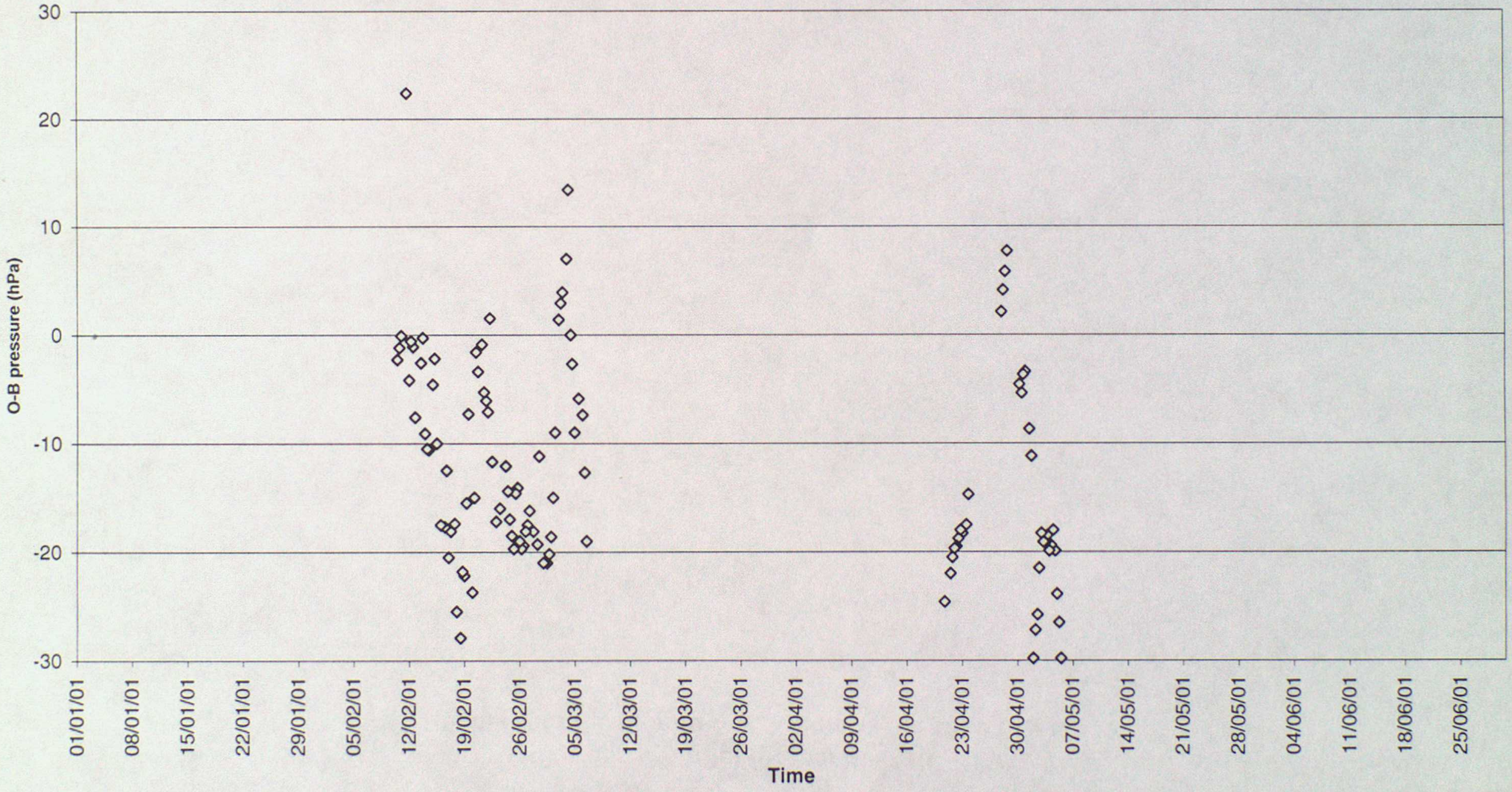




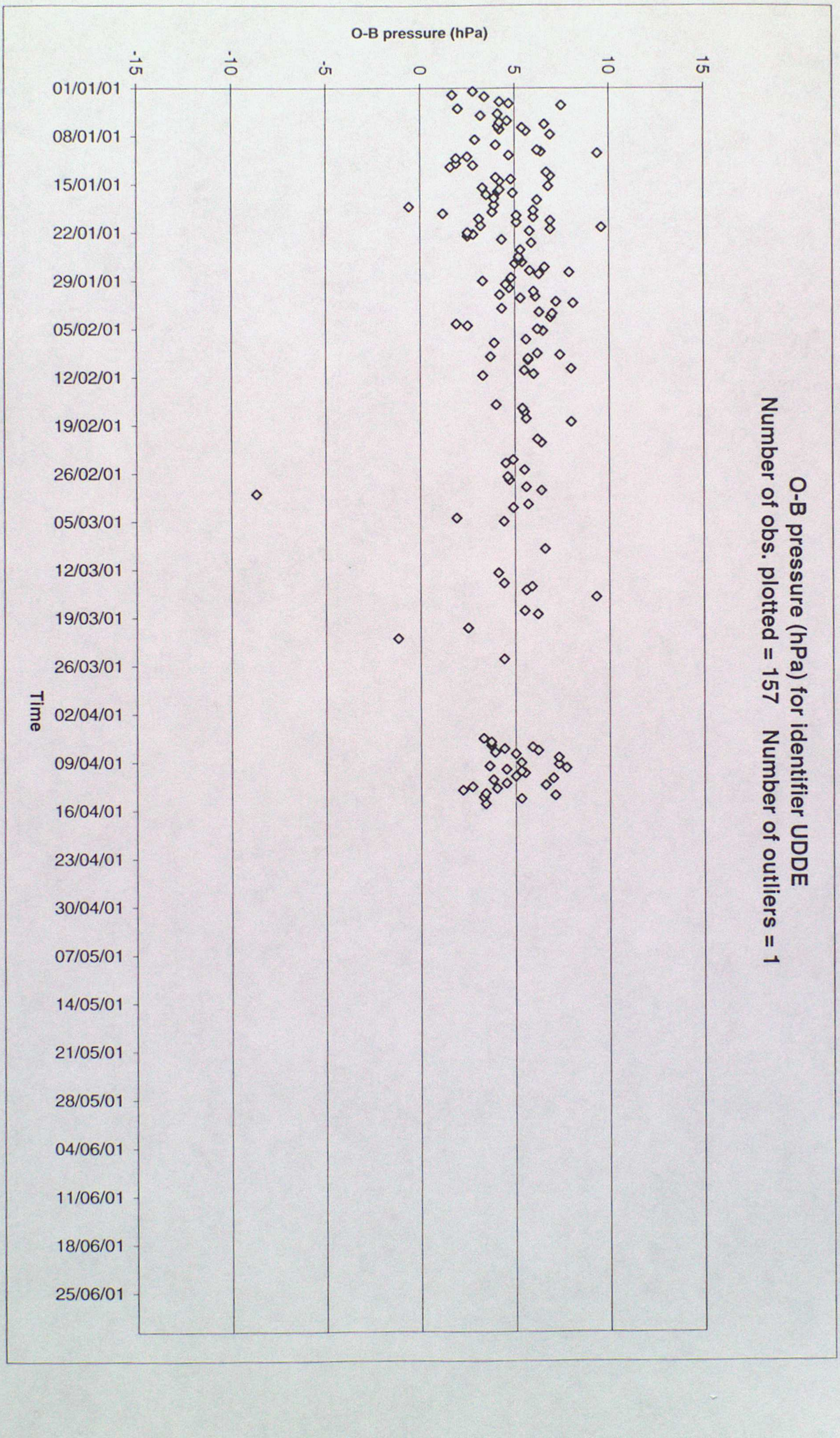
O-B pressure (hPa) for identifier UCKG
Number of obs. plotted = 62    Number of outliers = 1

O-B pressure (hPa) for identifier UCTQ
Number of obs. plotted = 48    Number of outliers = 0



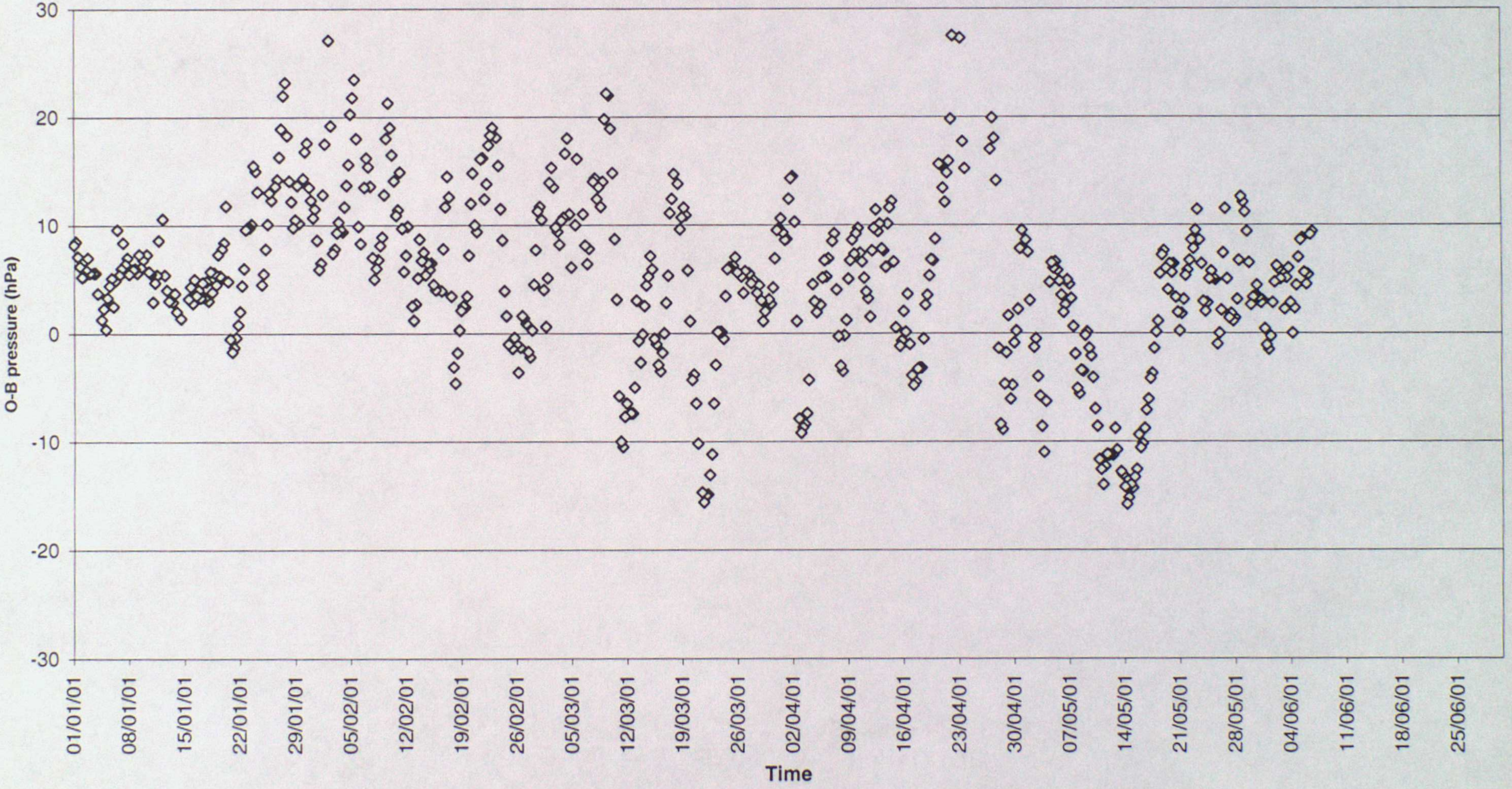


O-B pressure (hPa) for identifier UCUE
Number of obs. plotted = 109    Number of outliers = 2

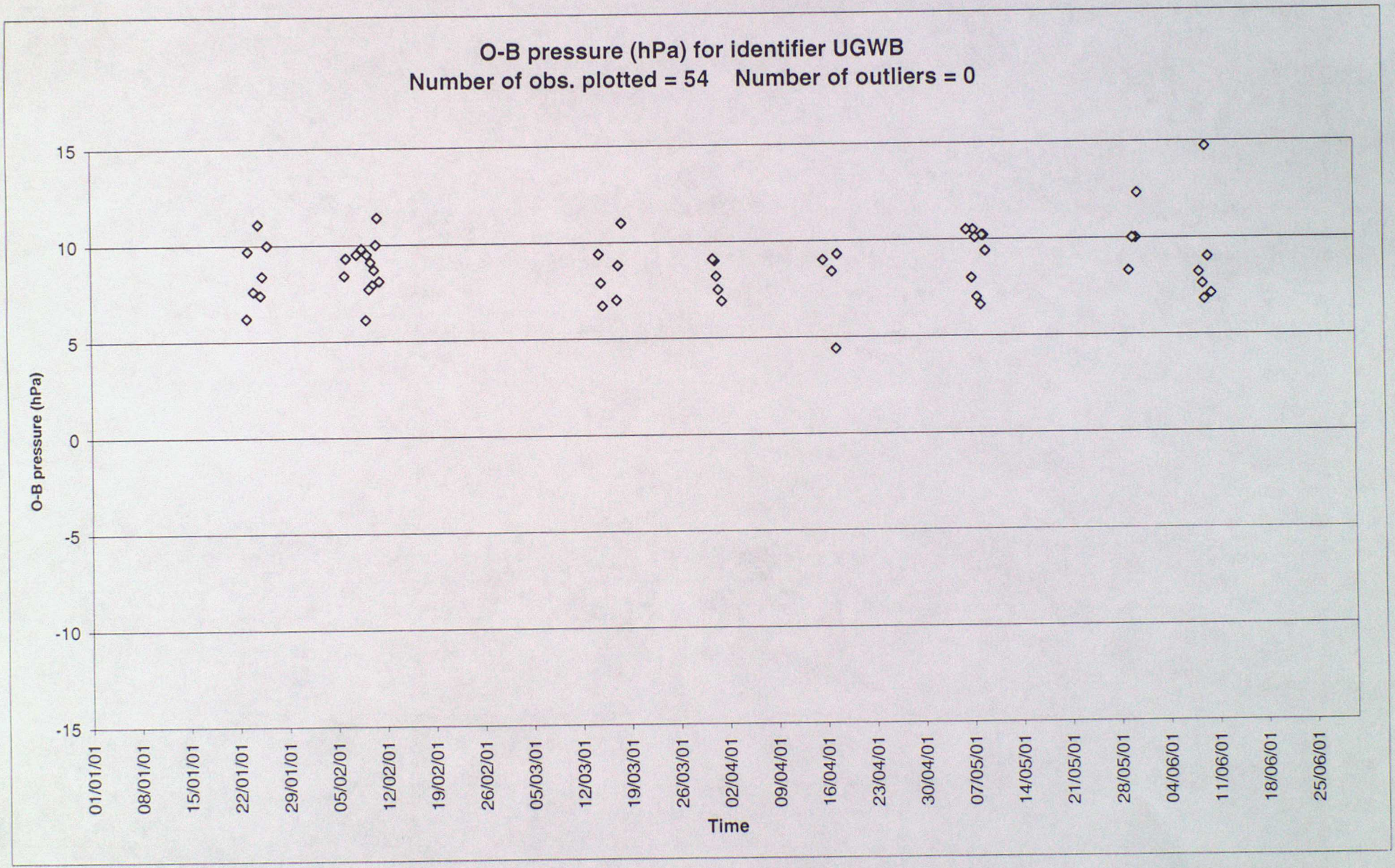


O-B pressure (hPa) for identifier UDDE

Number of obs. plotted = 157  Number of outliers = 1

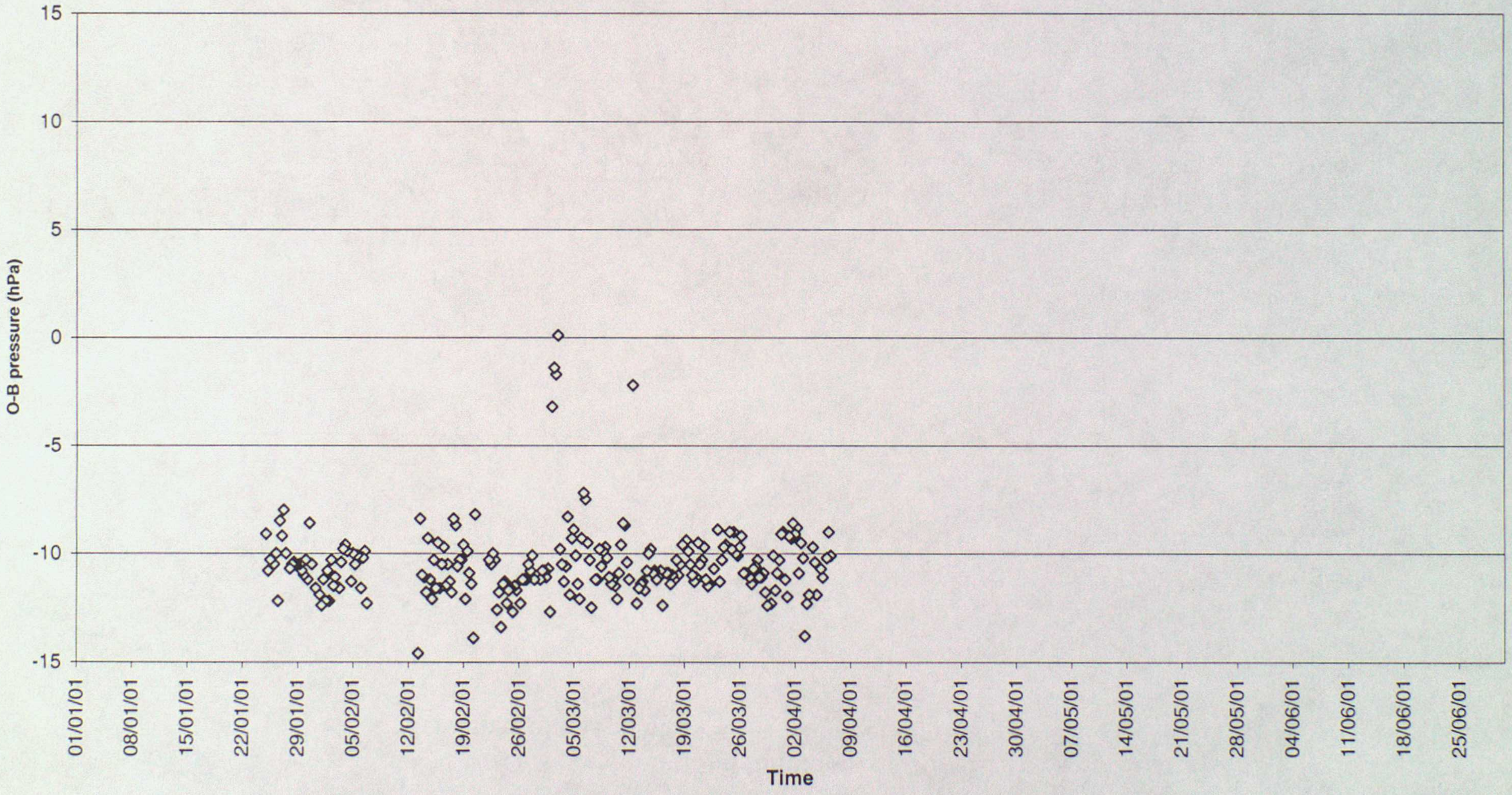


O-B pressure (hPa) for identifier UDYG
Number of obs. plotted = 569    Number of outliers = 3

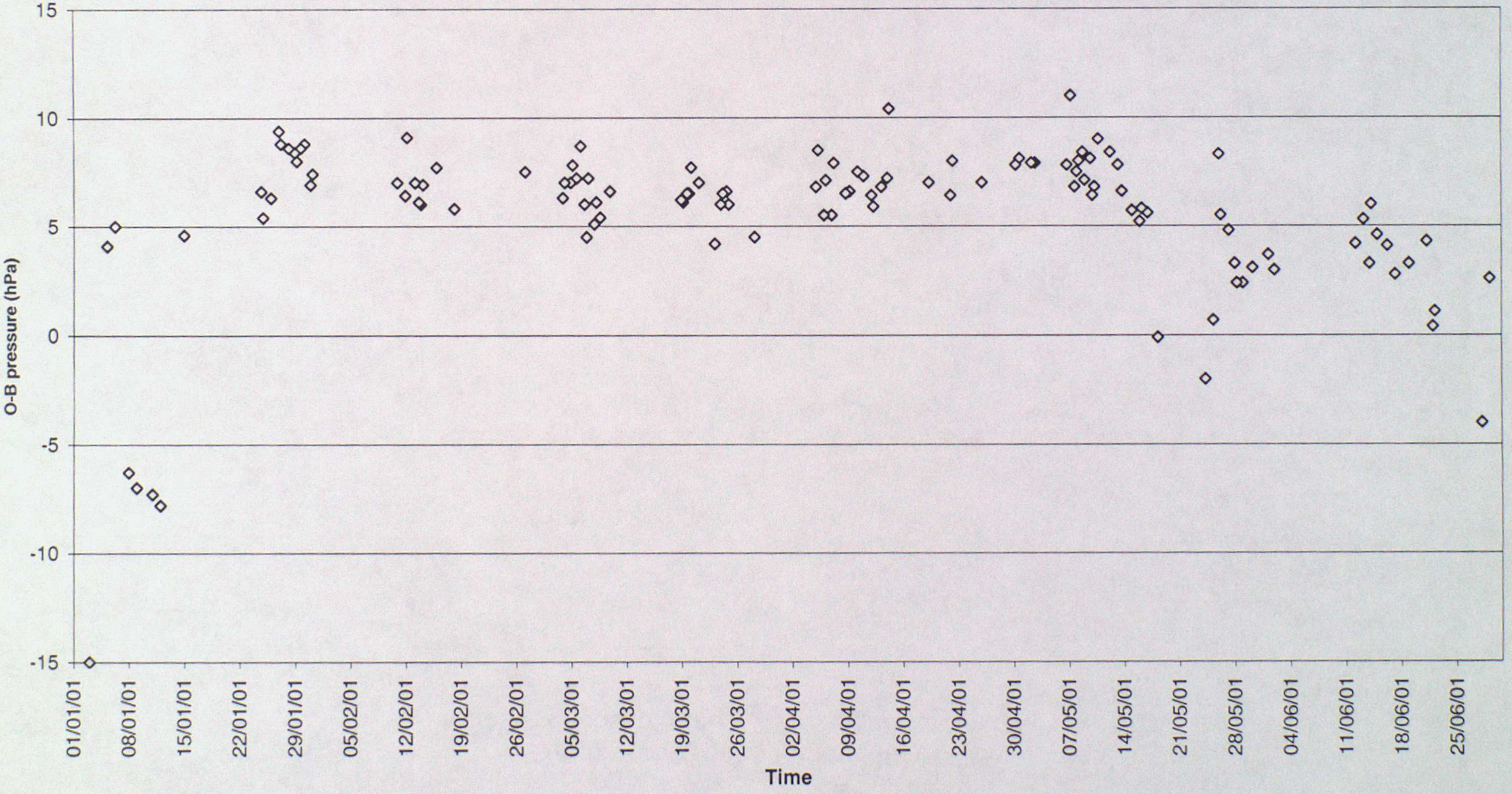


O-B pressure (hPa) for identifier UGWB
Number of obs. plotted = 54    Number of outliers = 0

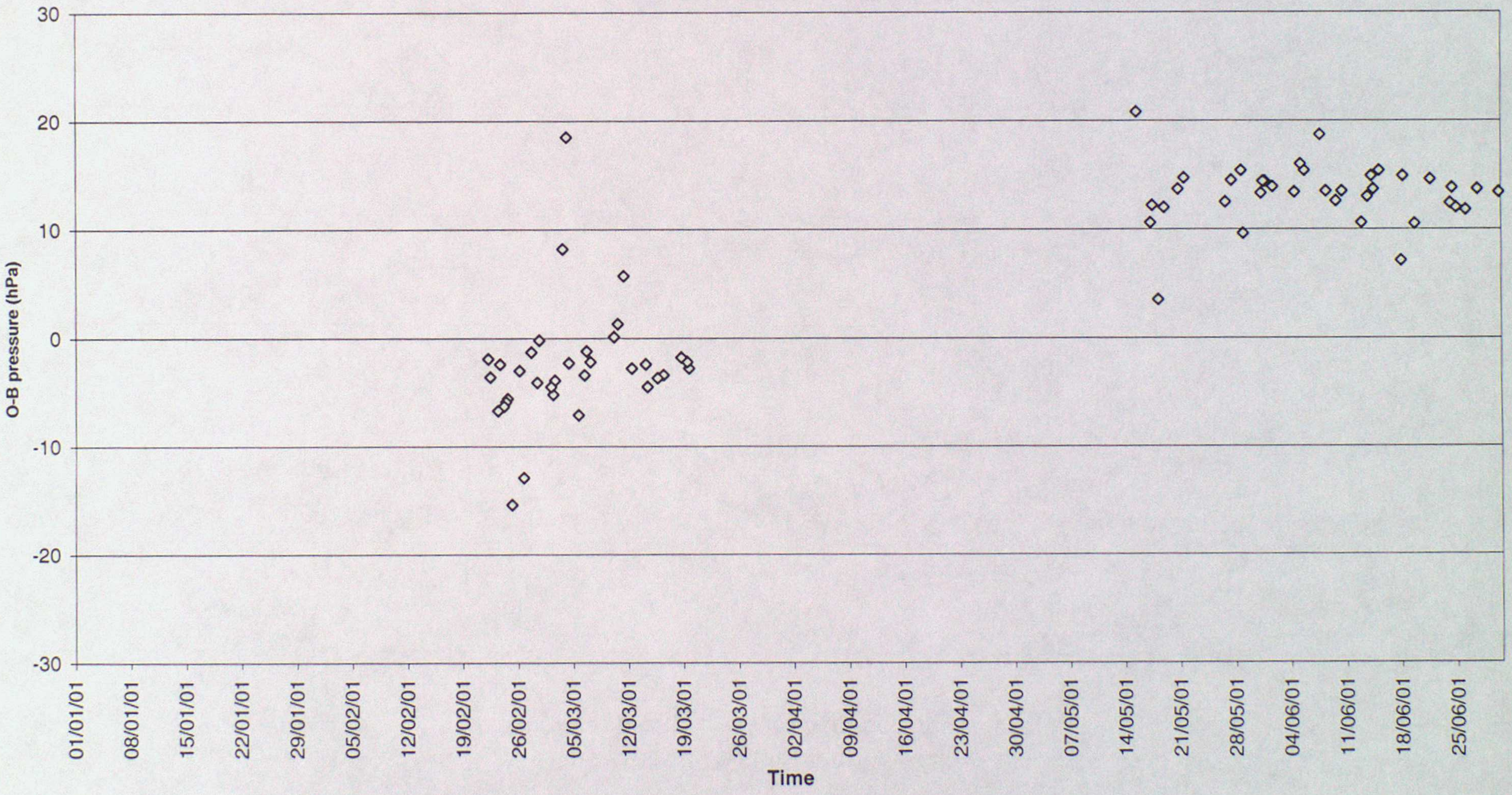
O-B pressure (hPa) for identifier UHLE
Number of obs. plotted = 232    Number of outliers = 2

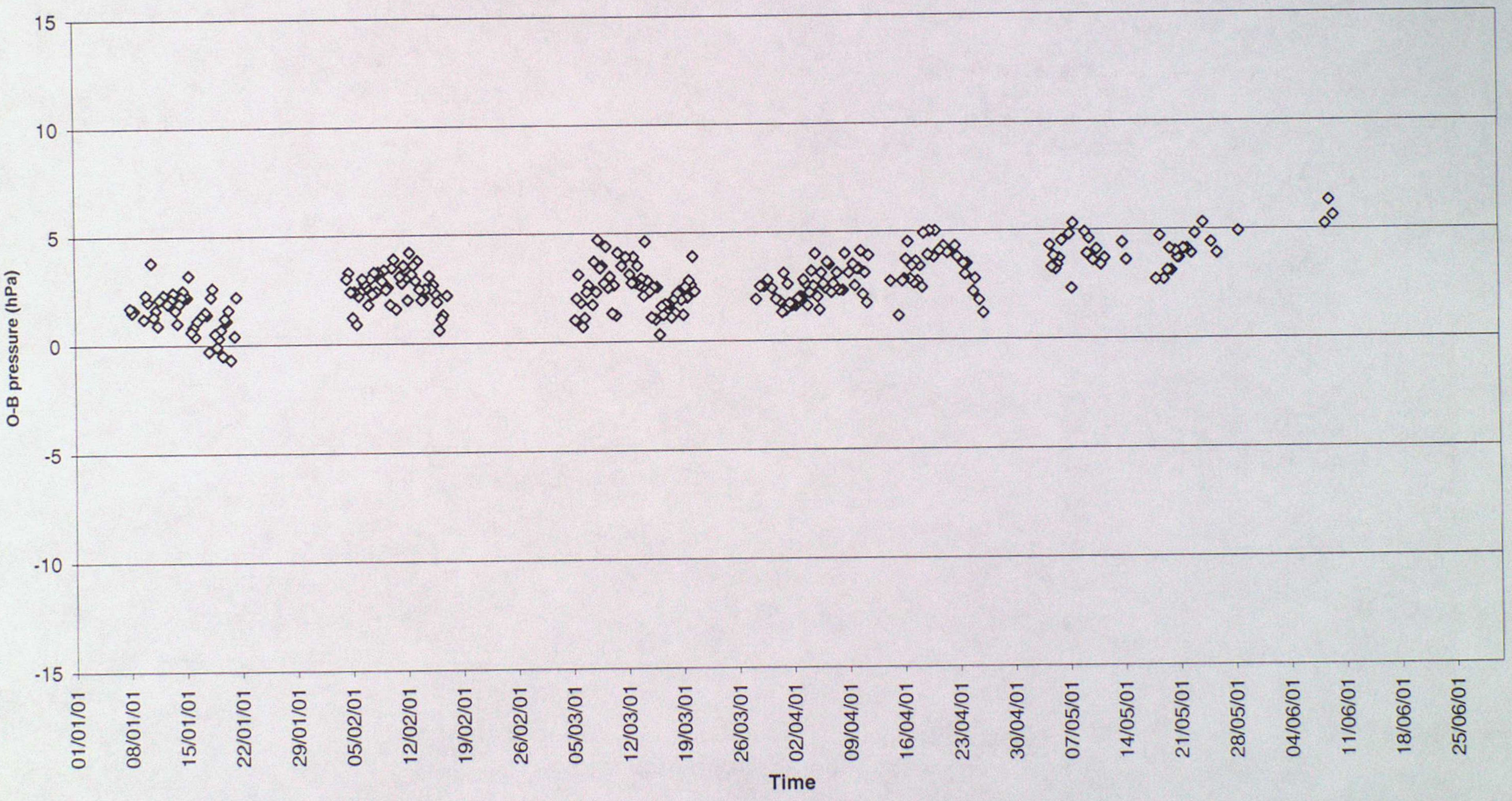


O-B pressure (hPa) for identifier UHVW
Number of obs. plotted = 121    Number of outliers = 1



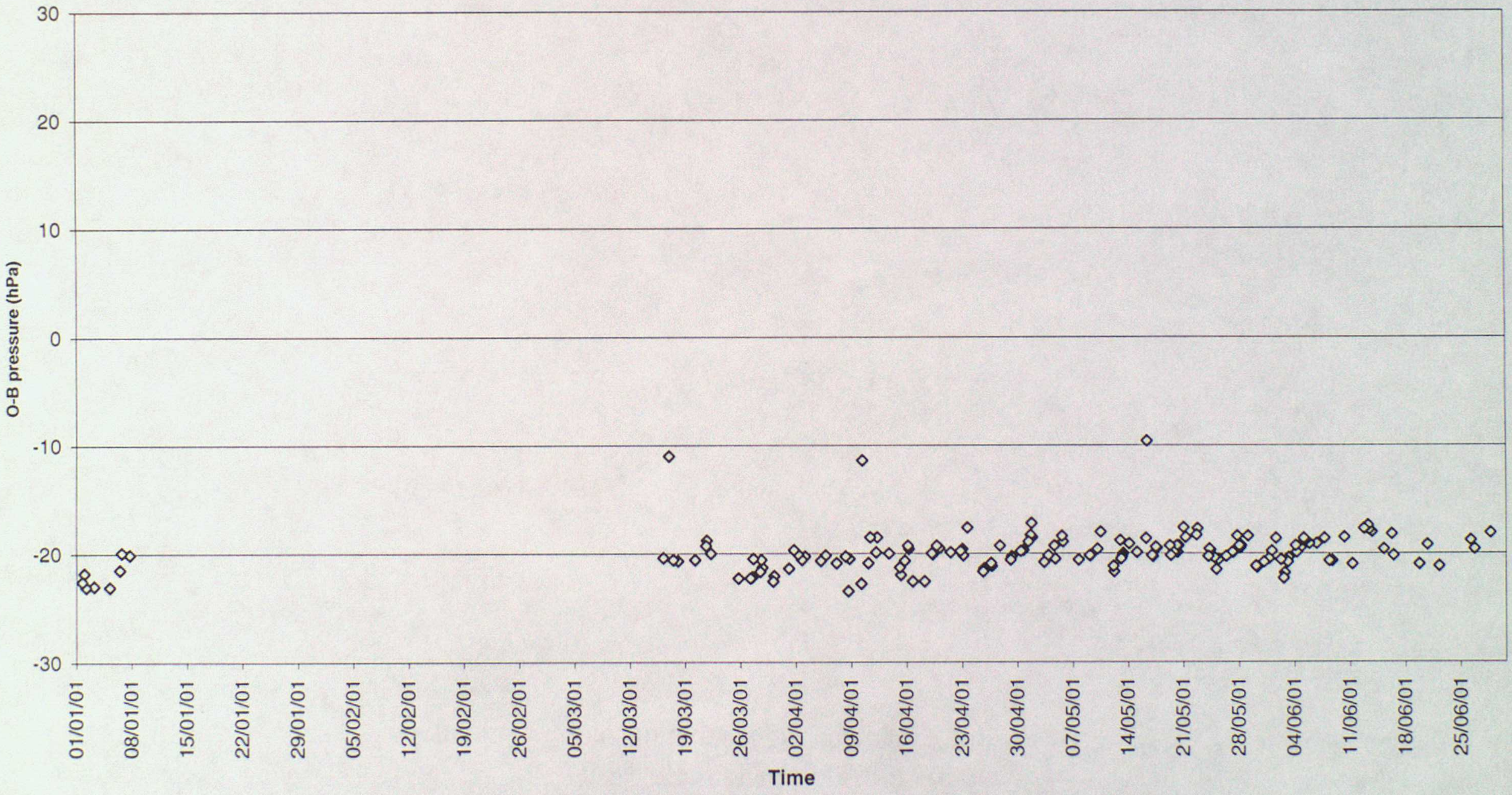
O-B pressure (hPa) for identifier UIDS
Number of obs. plotted = 71    Number of outliers = 3

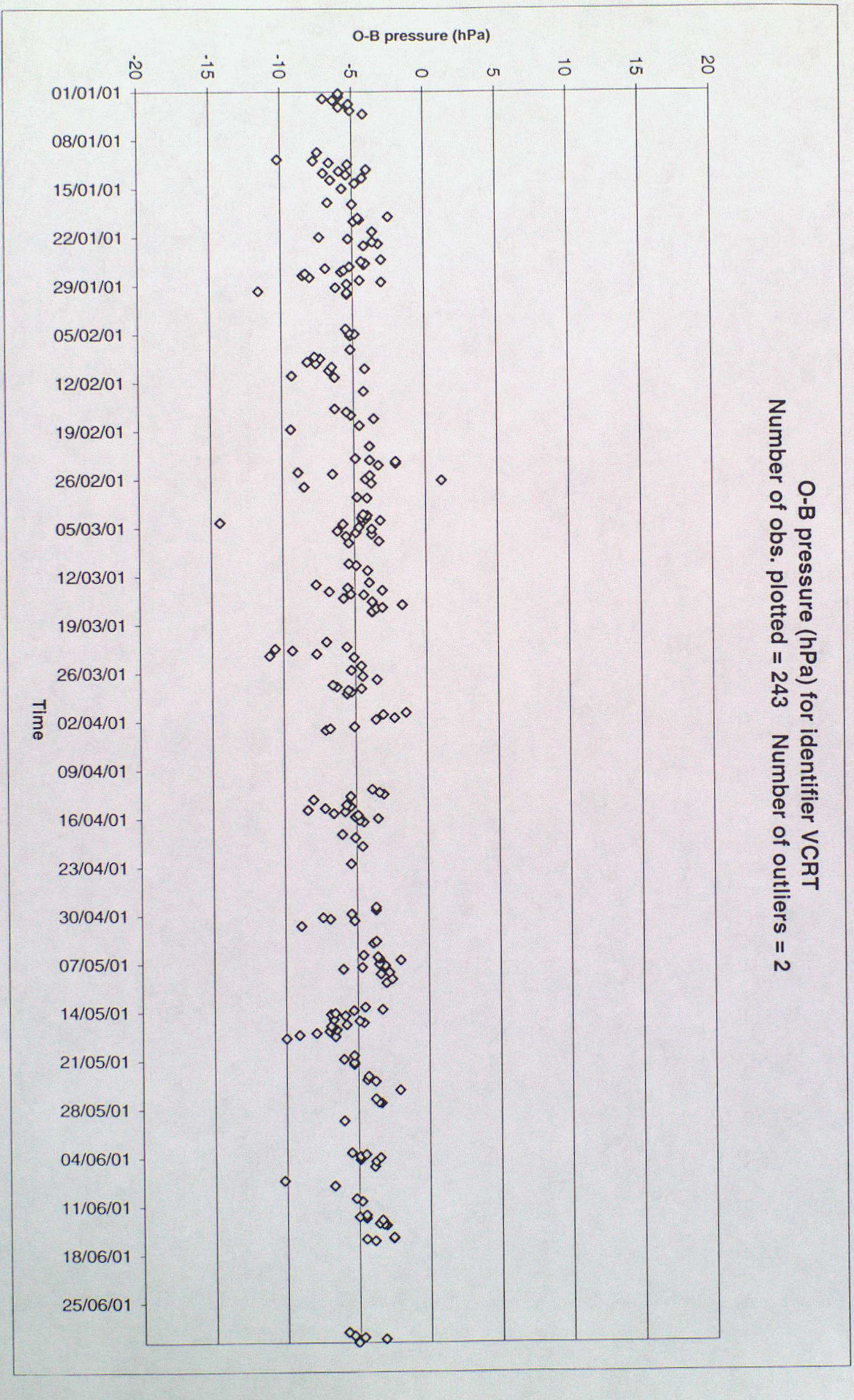




O-B pressure (hPa) for identifier UIKI
Number of obs. plotted = 266    Number of outliers = 1

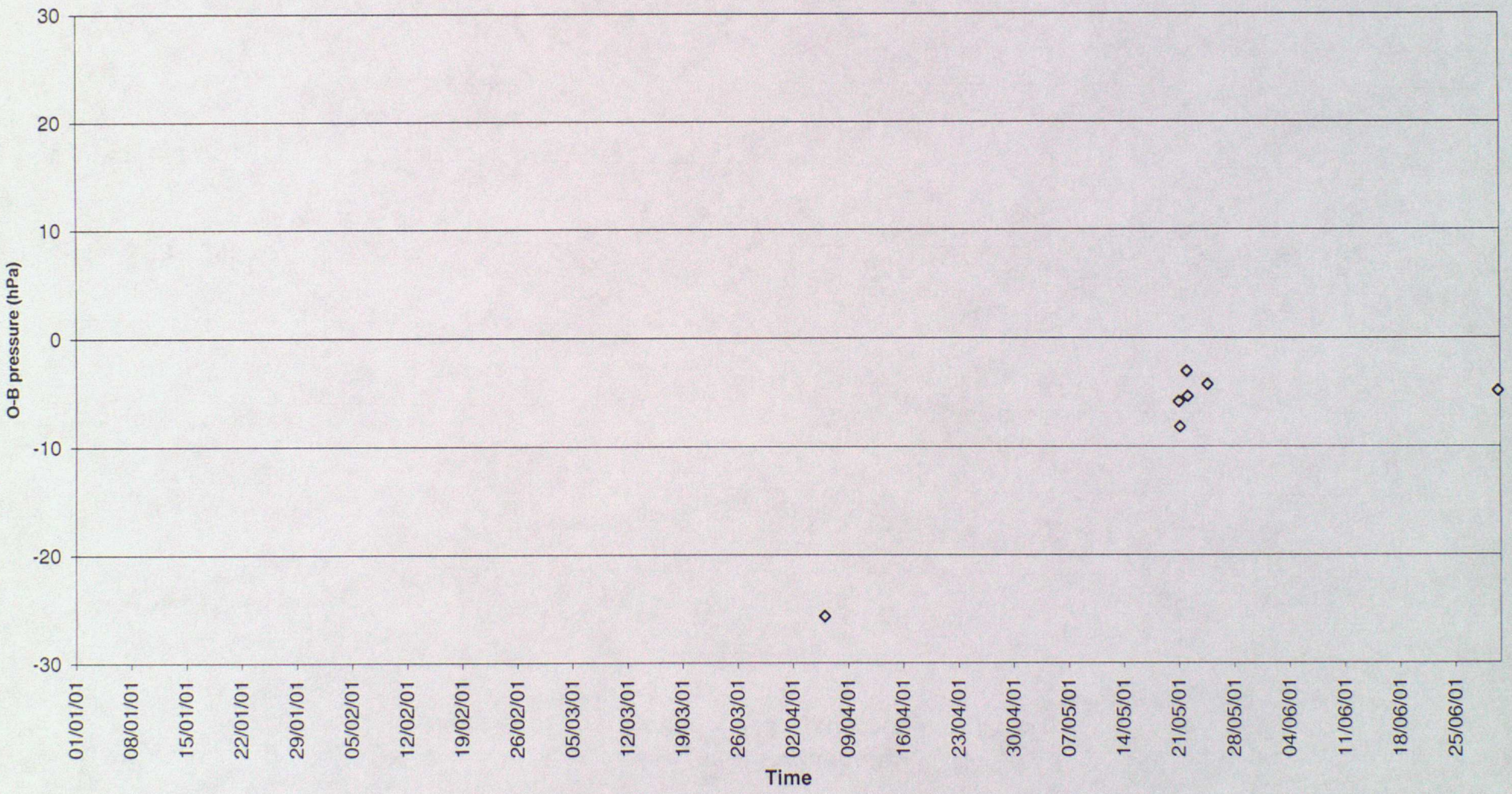
O-B pressure (hPa) for identifier VCJM
Number of obs. plotted = 157    Number of outliers = 1



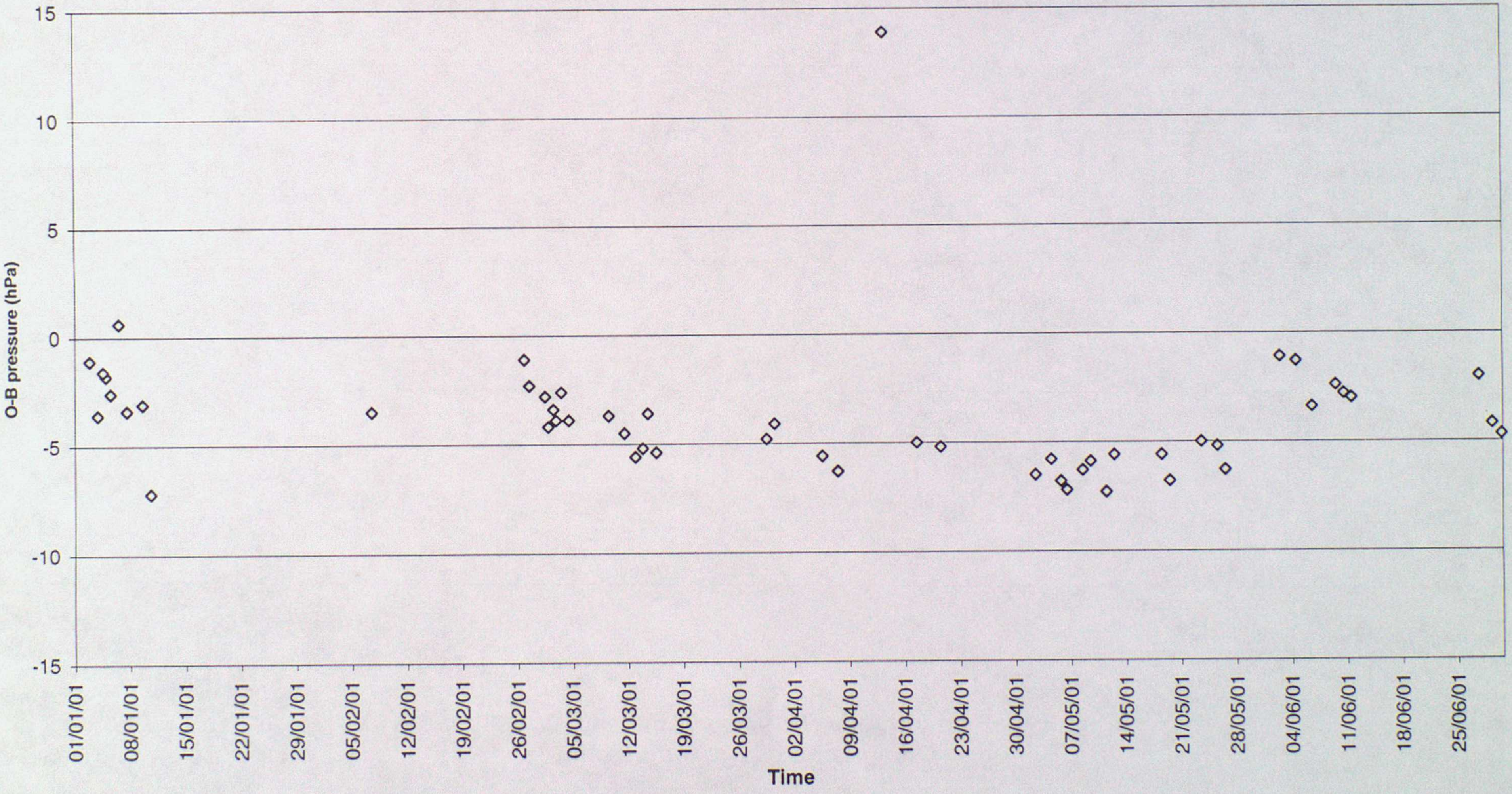


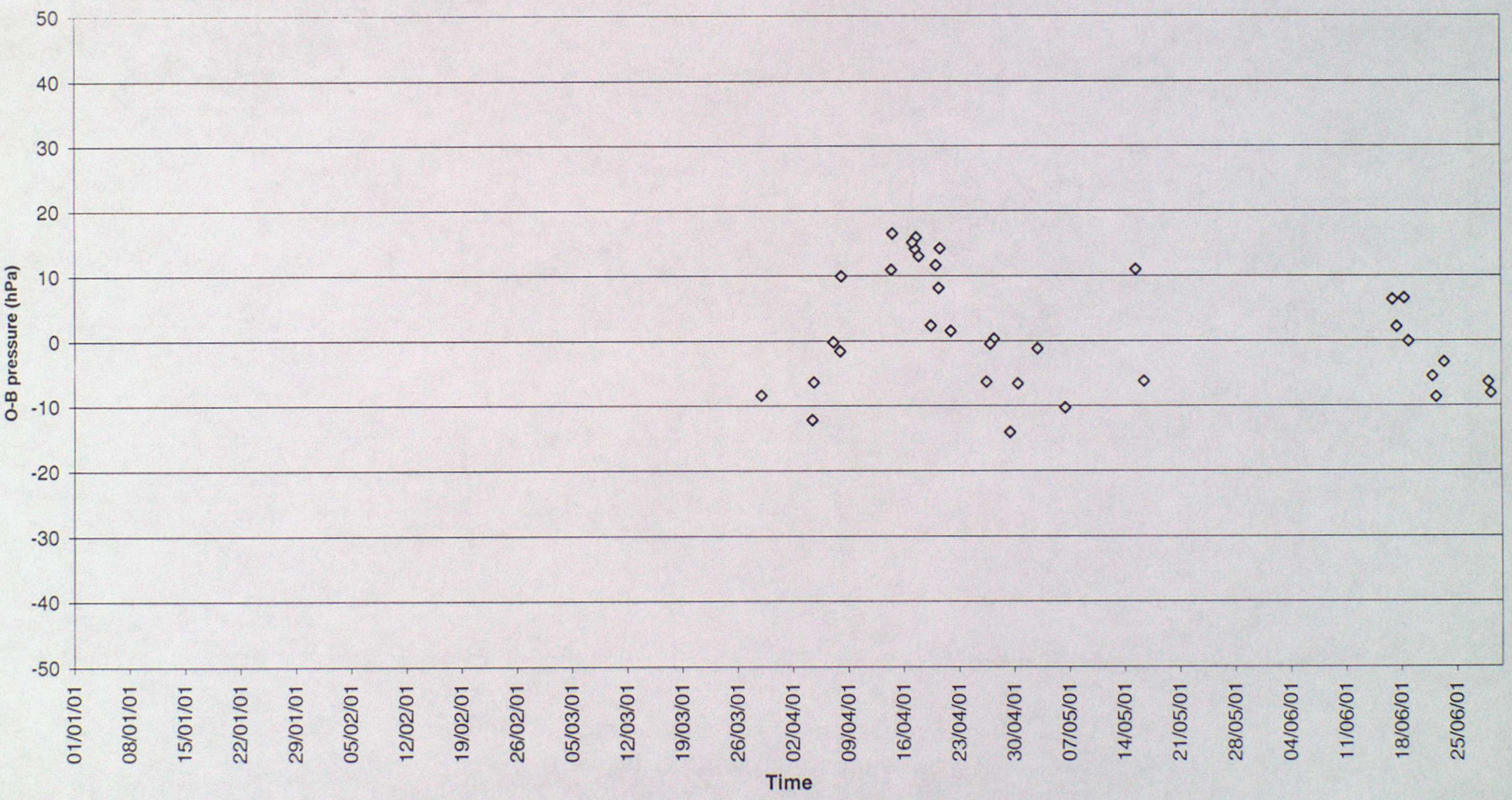
O-B pressure (hPa) for identifier VCRT
Number of obs. plotted = 243 Number of outliers = 2

O-B pressure (hPa) for identifier VDWC
Number of obs. plotted = 7    Number of outliers = 37

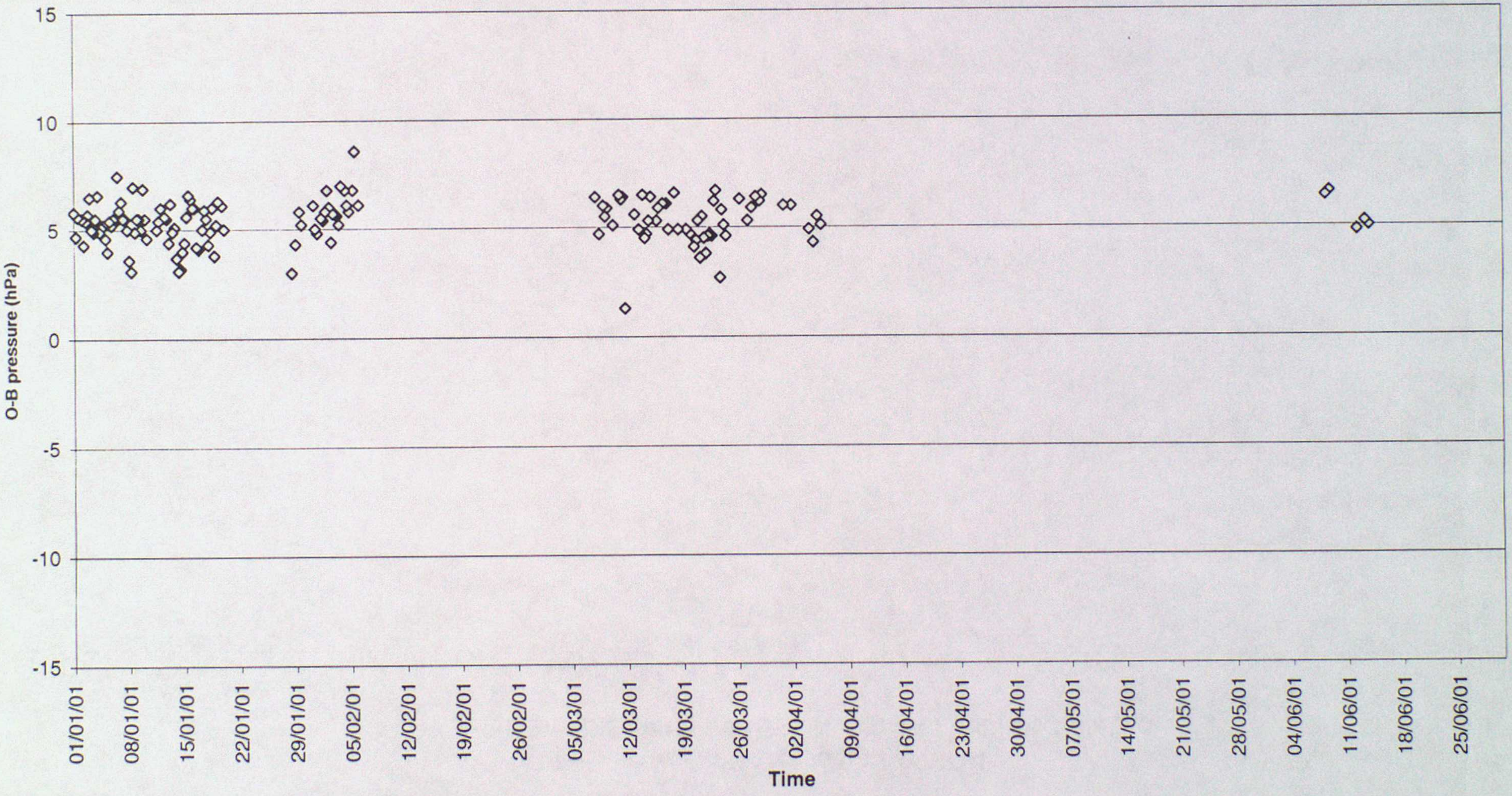


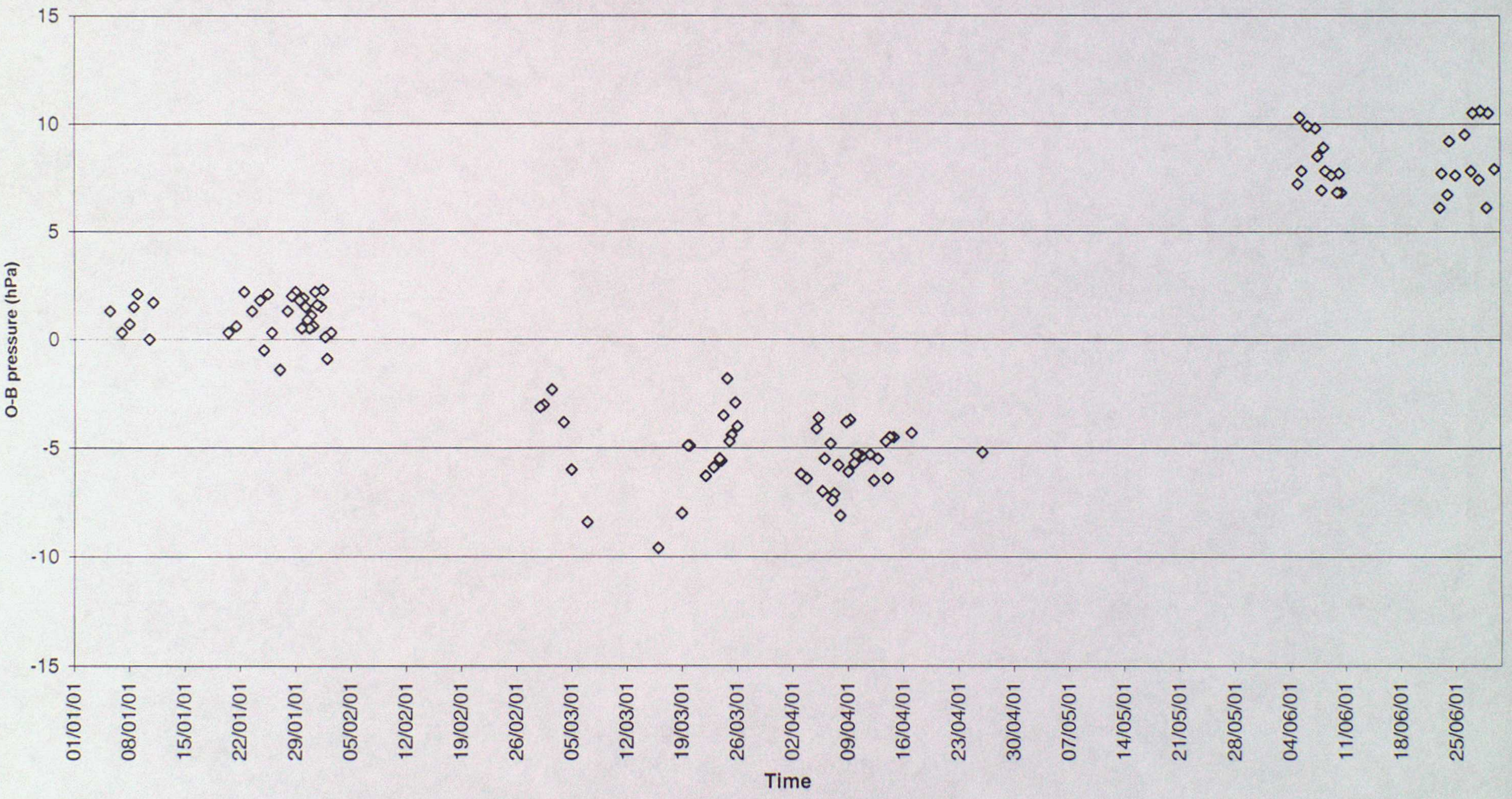
O-B pressure (hPa) for identifier VGDT
Number of obs. plotted = 53    Number of outliers = 0




O-B pressure (hPa) for identifier VGJC
Number of obs. plotted = 35    Number of outliers = 22

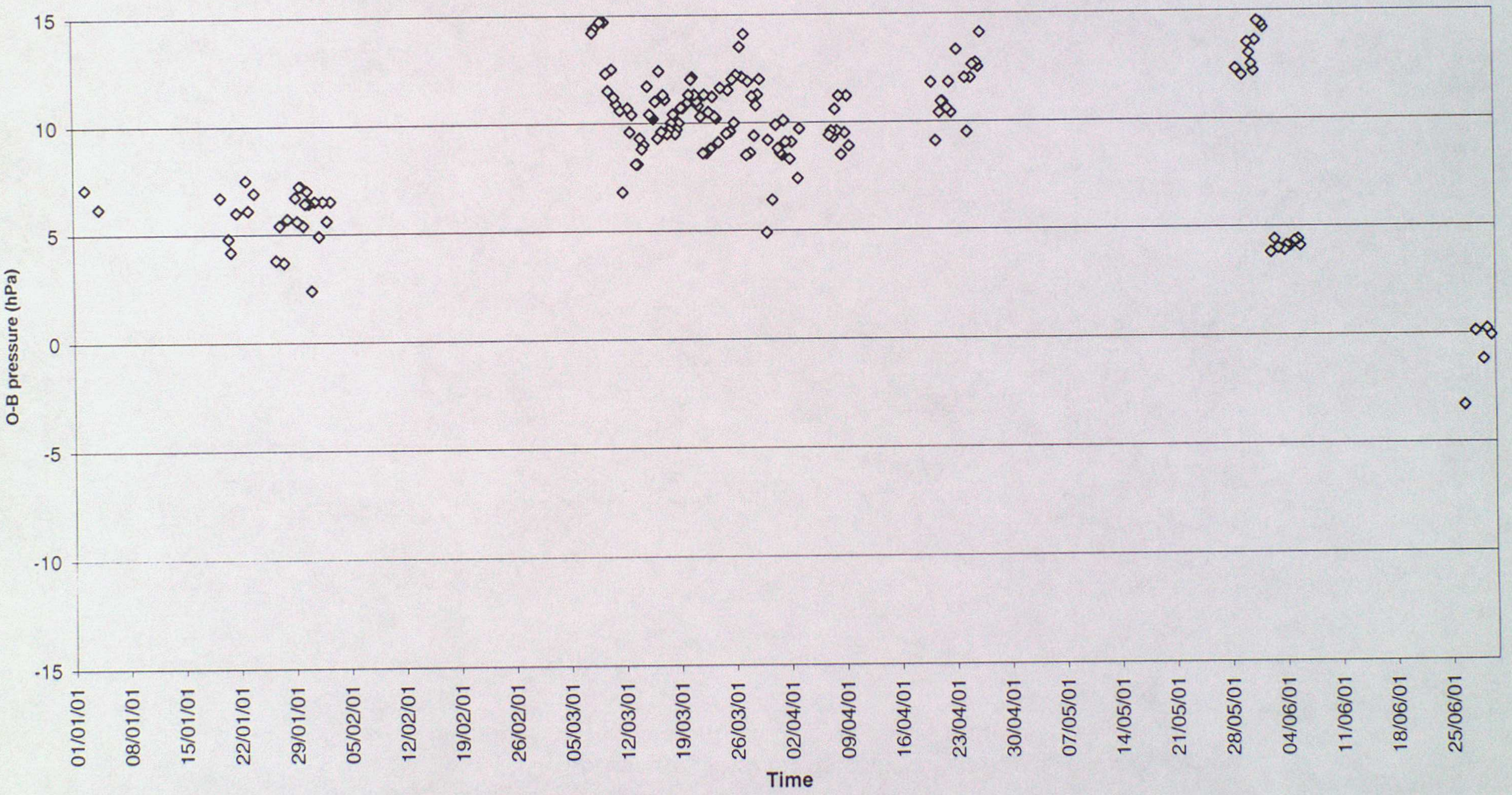
O-B pressure (hPa) for identifier VRVI2
Number of obs. plotted = 152    Number of outliers = 0



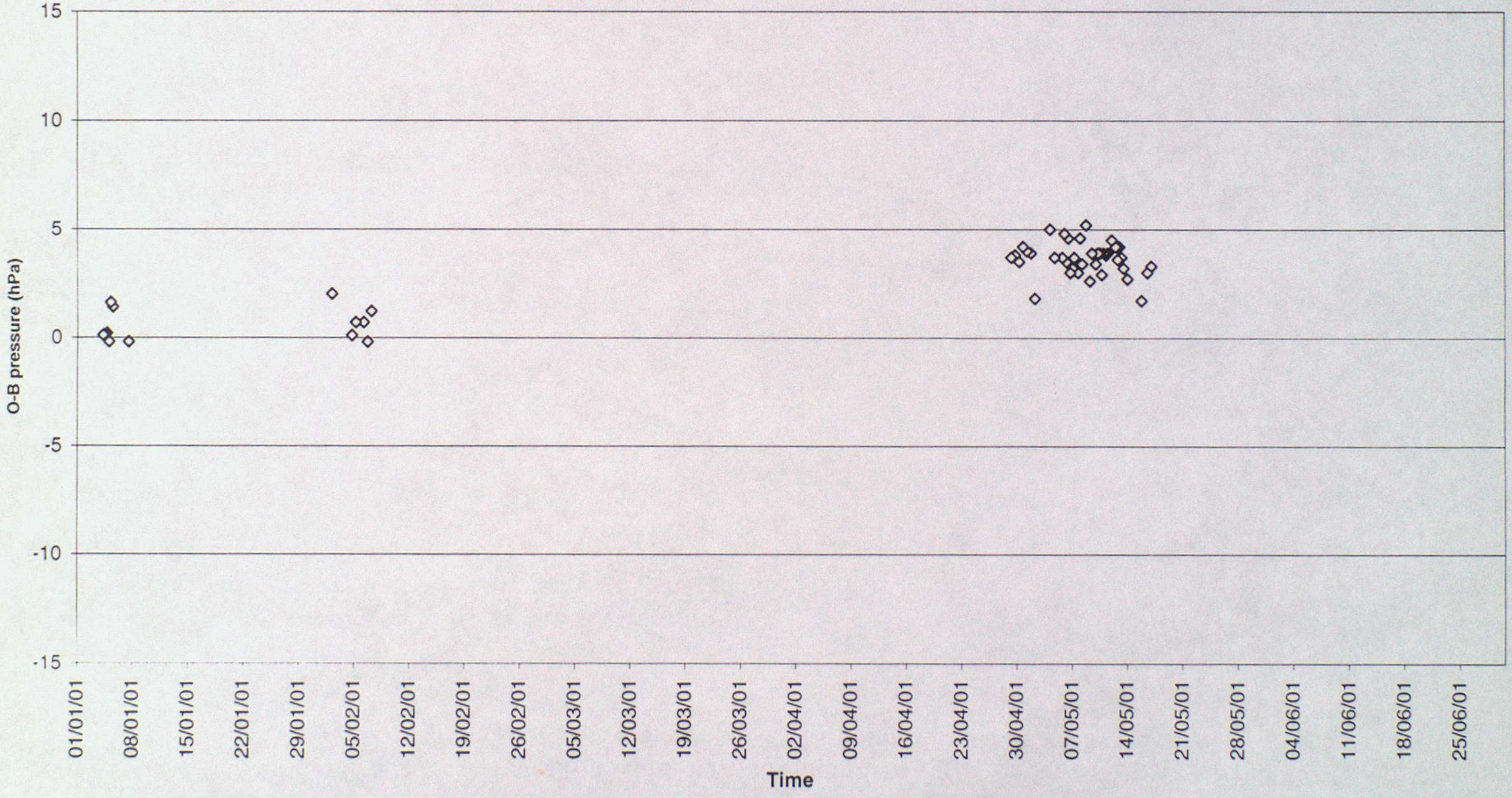


O-B pressure (hPa) for identifier VTST
Number of obs. plotted = 107    Number of outliers = 0

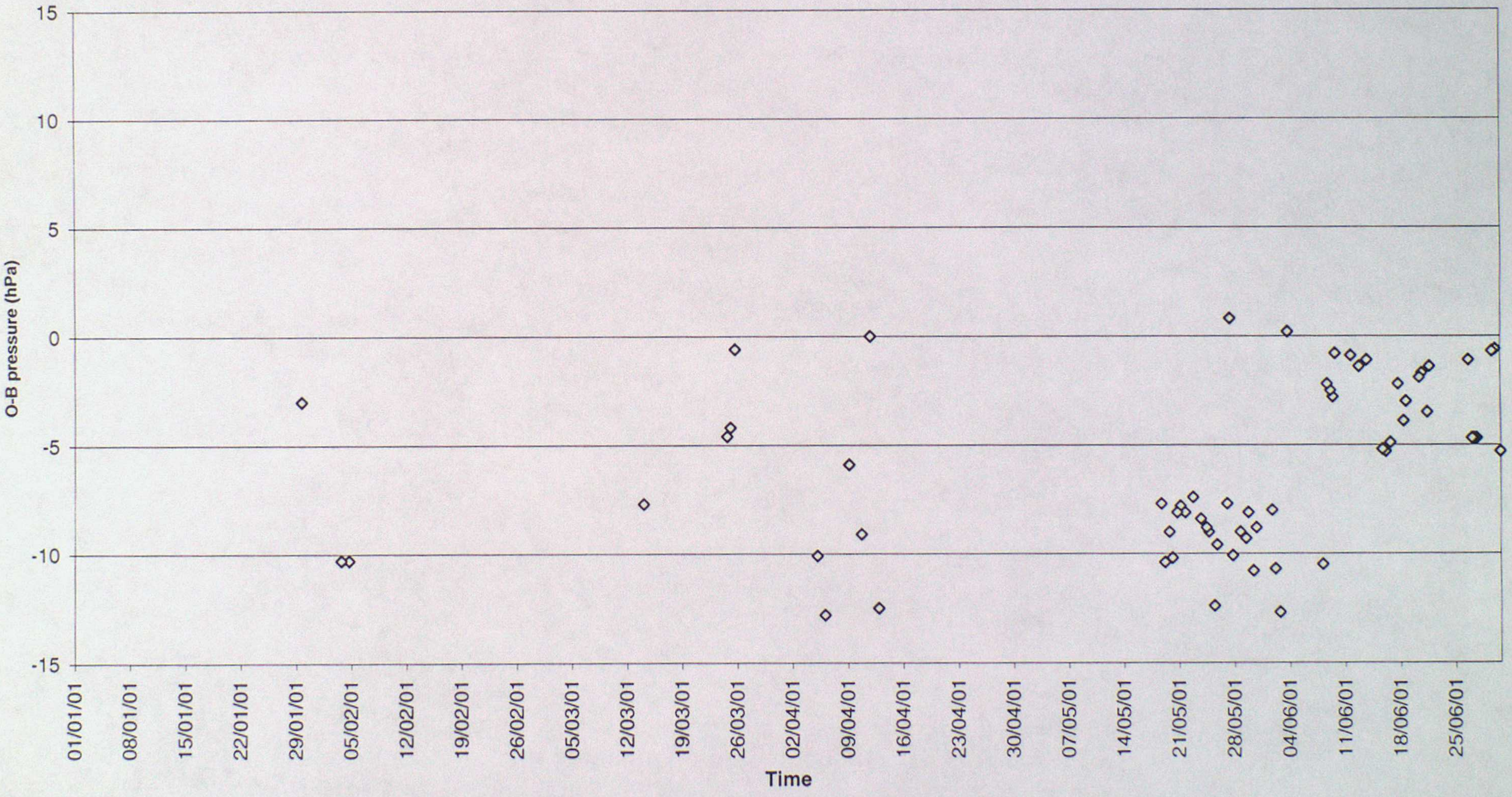
## O-B pressure (hPa) for identifier VVGC
Number of obs. plotted = 163    Number of outliers = 5

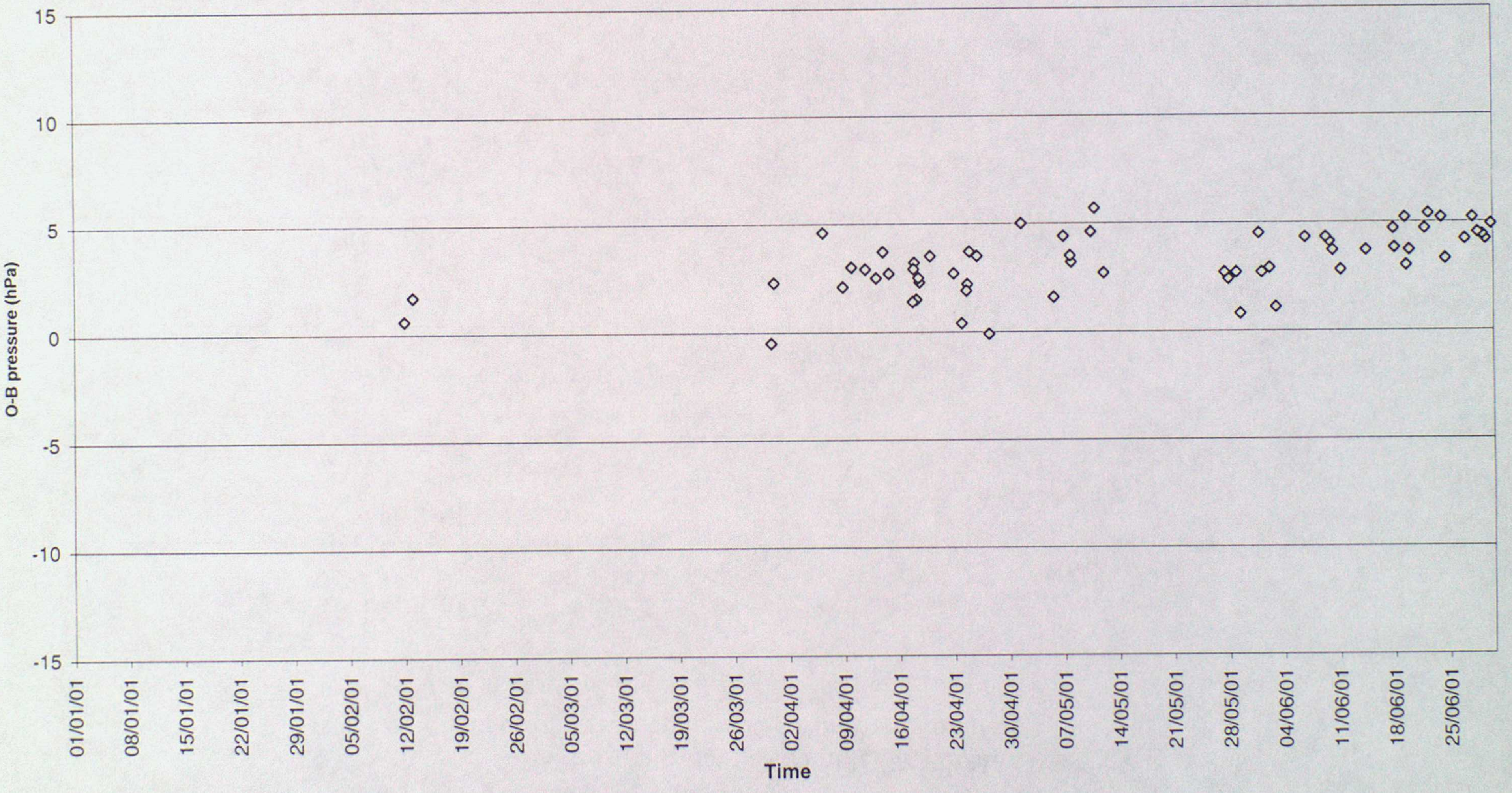


O-B pressure (hPa) for identifier WAFA
Number of obs. plotted = 52    Number of outliers = 0

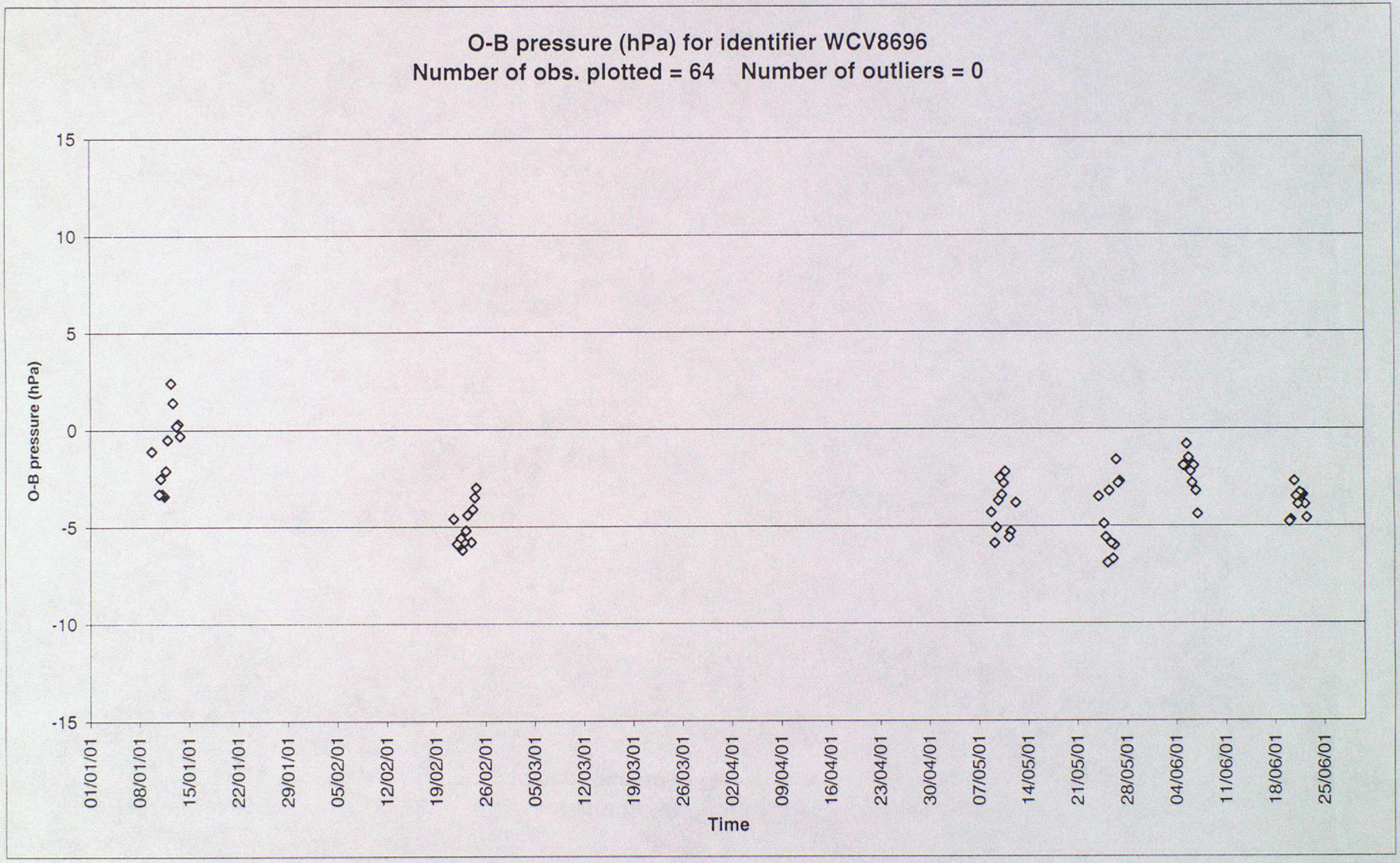


O-B pressure (hPa) for identifier WAZ9548
Number of obs. plotted = 63    Number of outliers = 2



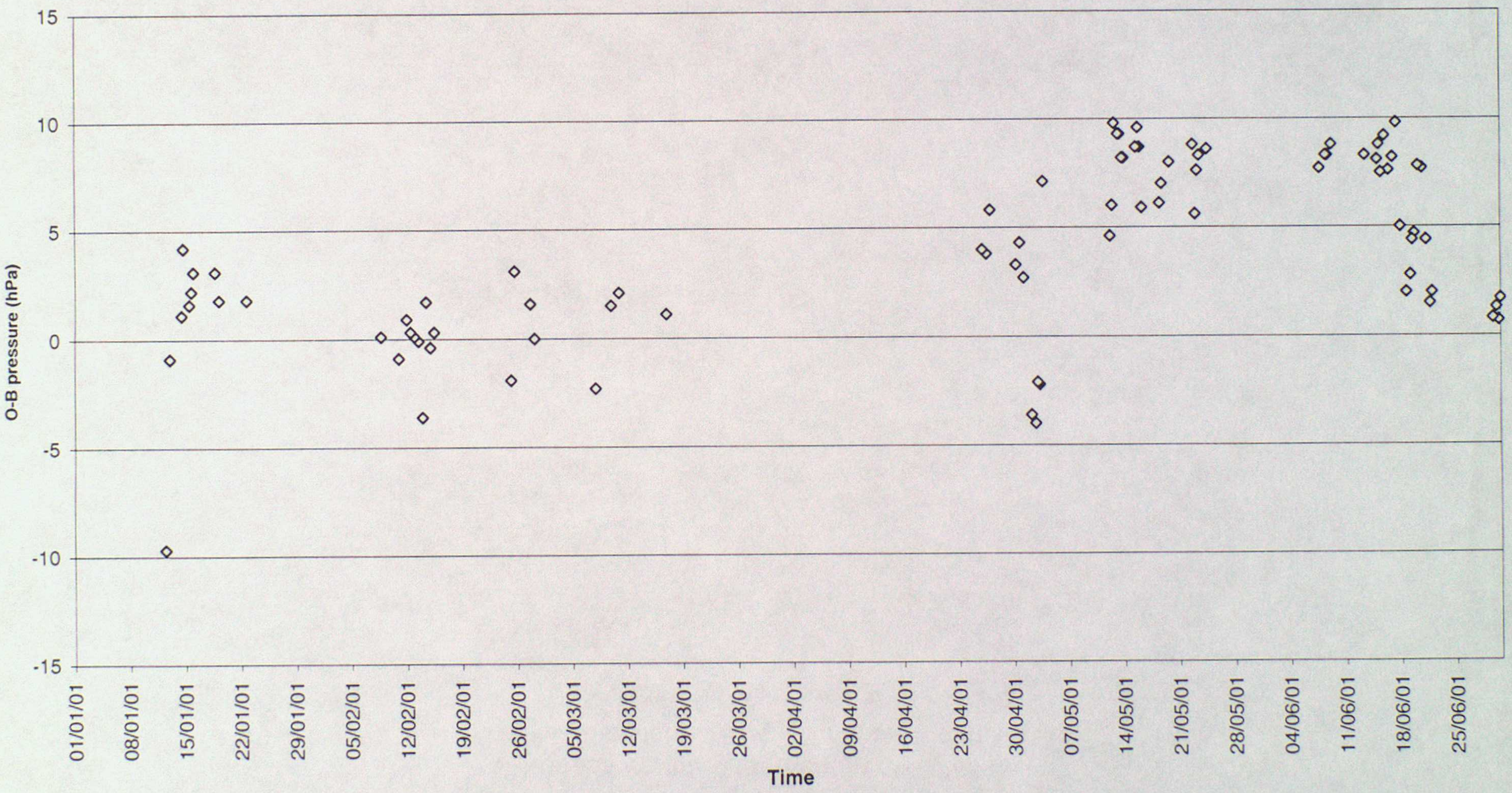


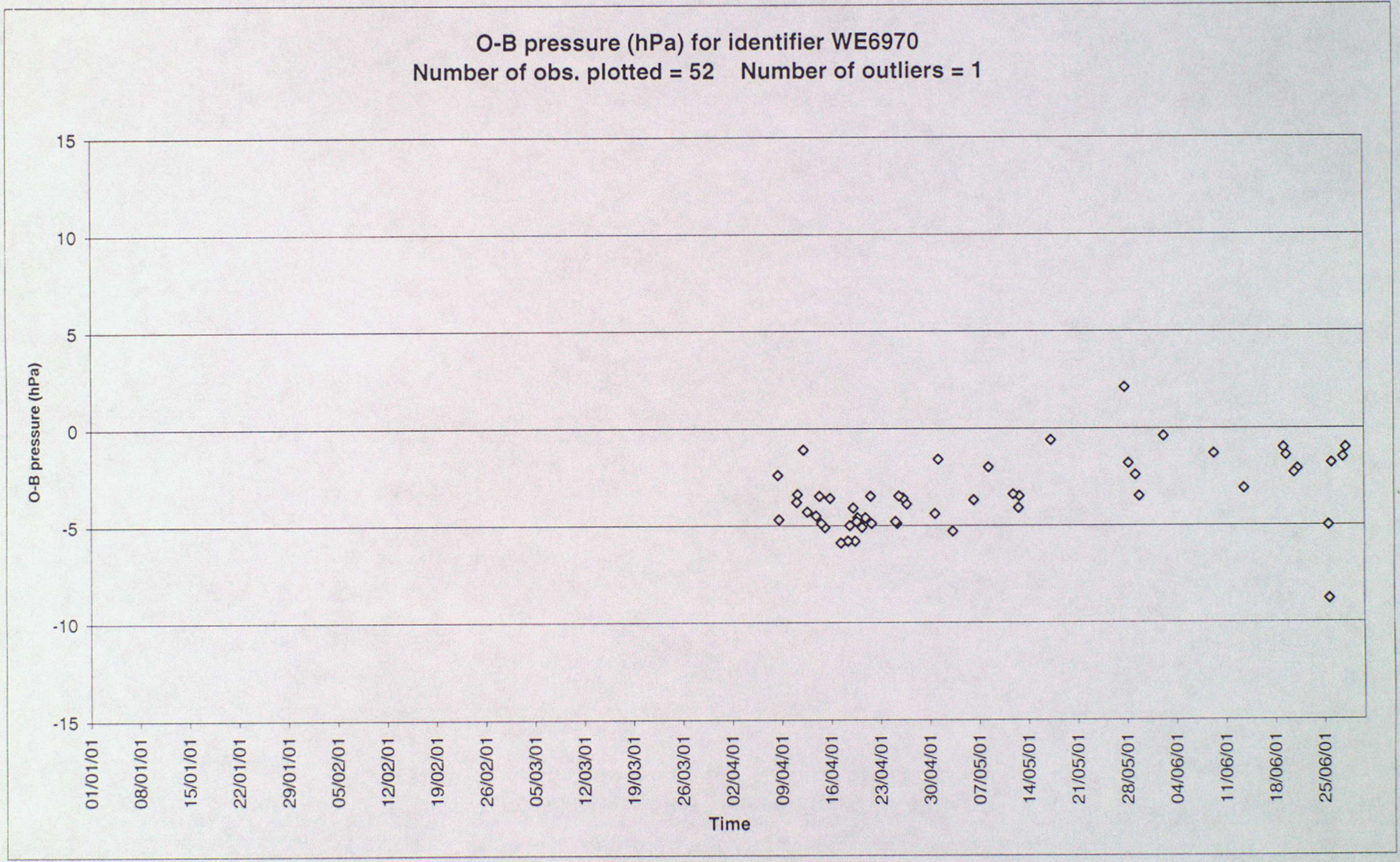
O-B pressure (hPa) for identifier WCV7620
Number of obs. plotted = 62    Number of outliers = 0



O-B pressure (hPa) for identifier WCV8696
Number of obs. plotted = 64    Number of outliers = 0

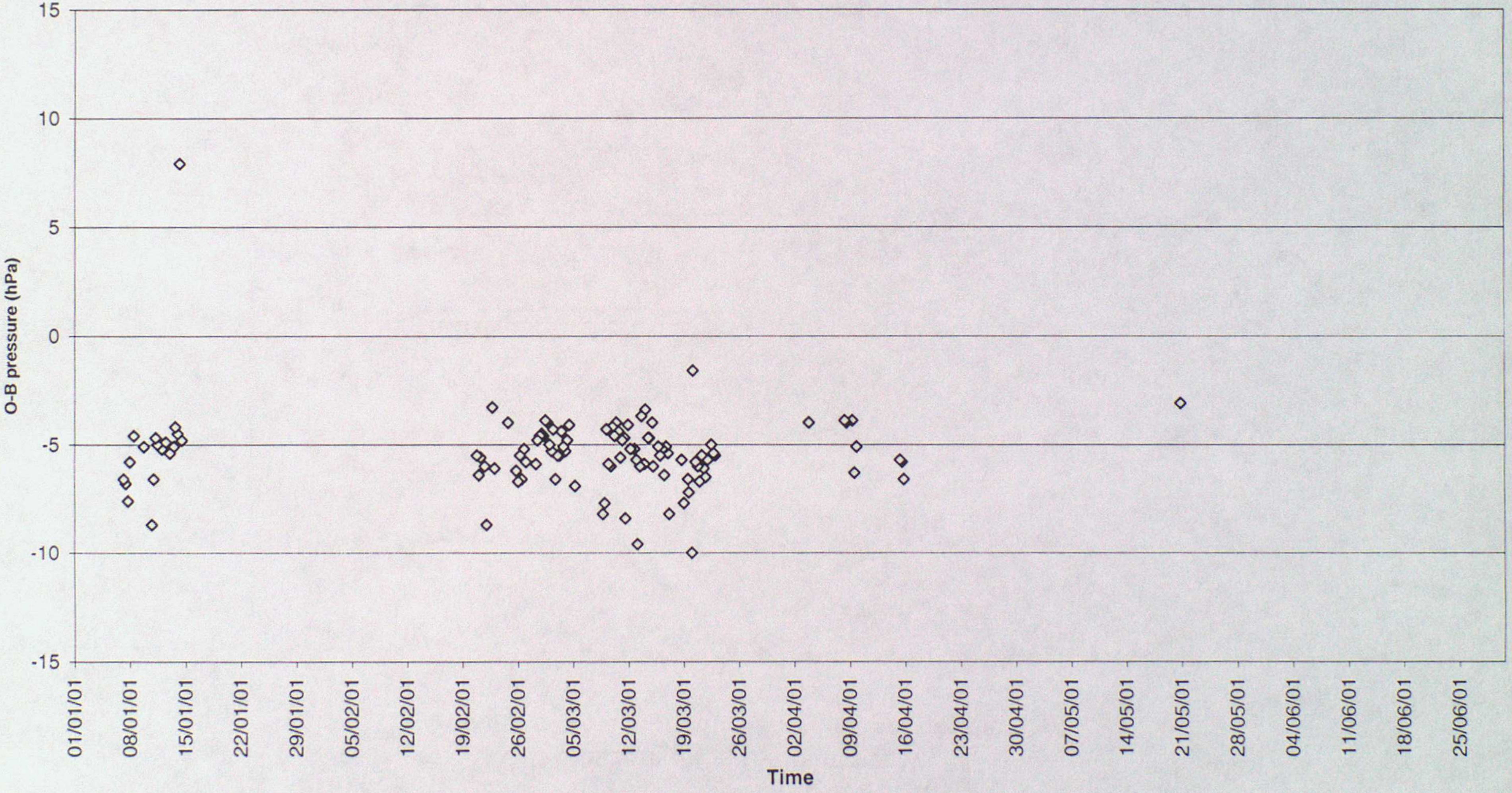
O-B pressure (hPa) for identifier WCX8884
Number of obs. plotted = 84    Number of outliers = 0



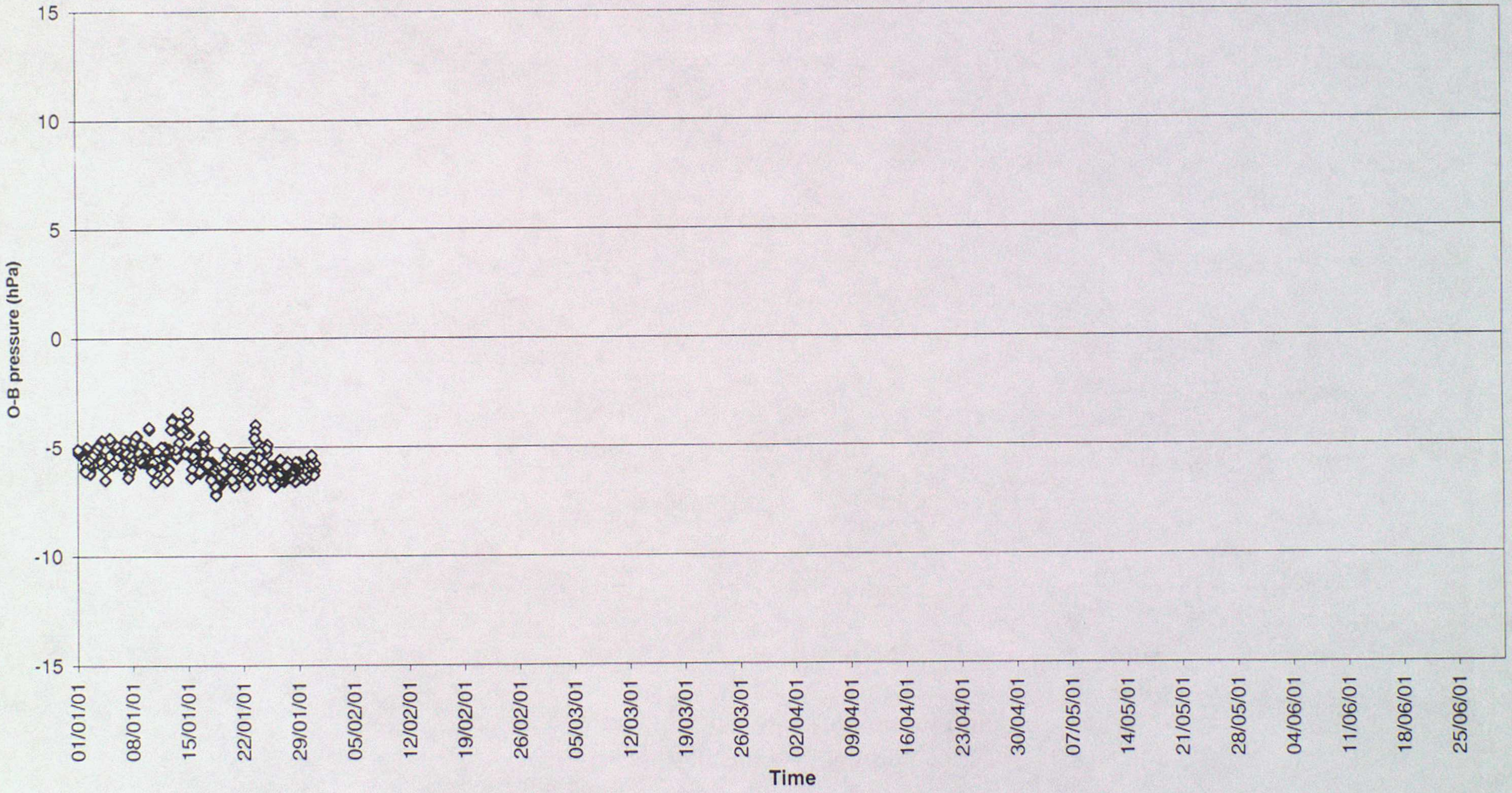


O-B pressure (hPa) for identifier WE6970
Number of obs. plotted = 52    Number of outliers = 1

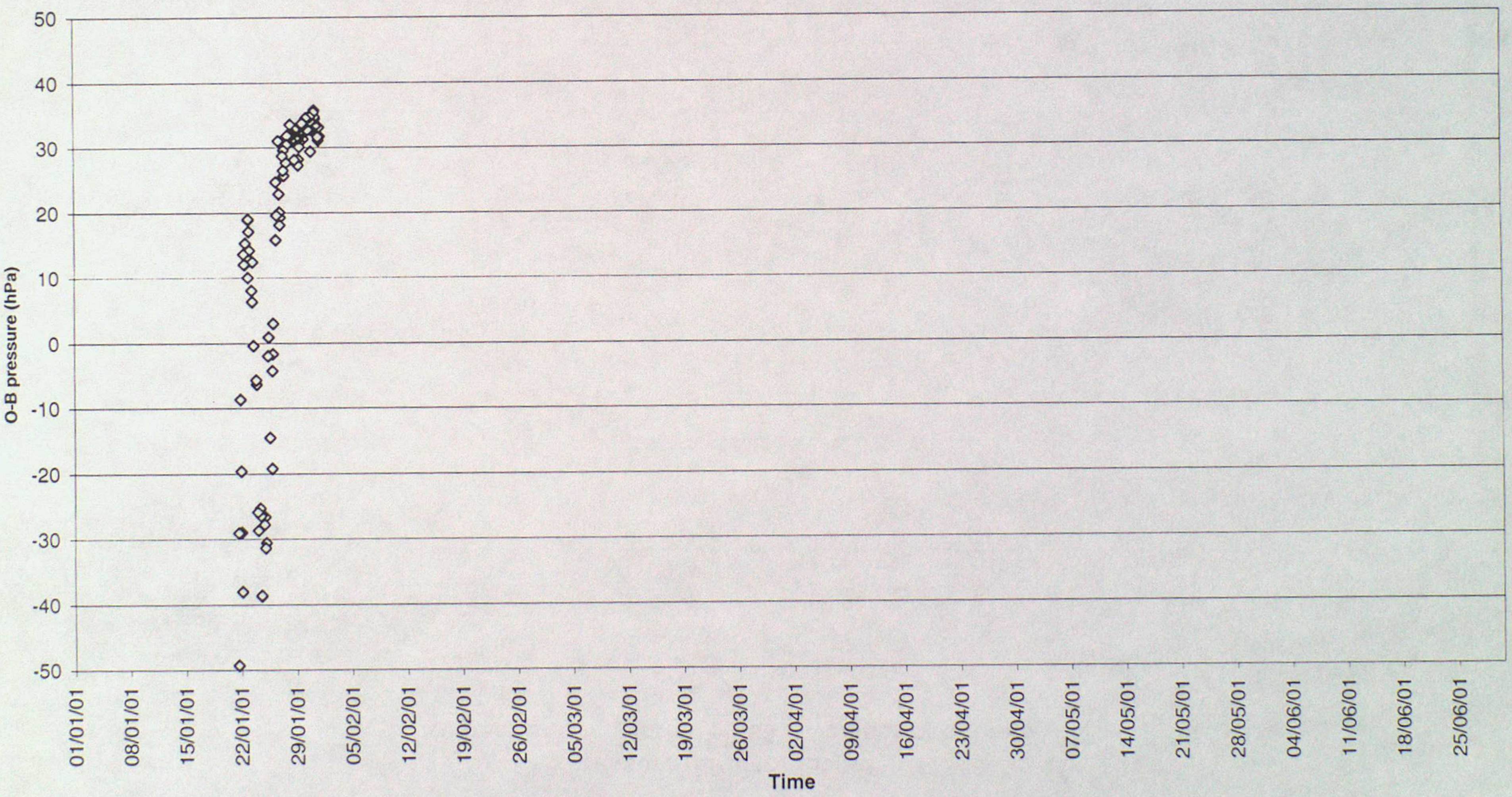
O-B pressure (hPa) for identifier WWXA
Number of obs. plotted = 110    Number of outliers = 0



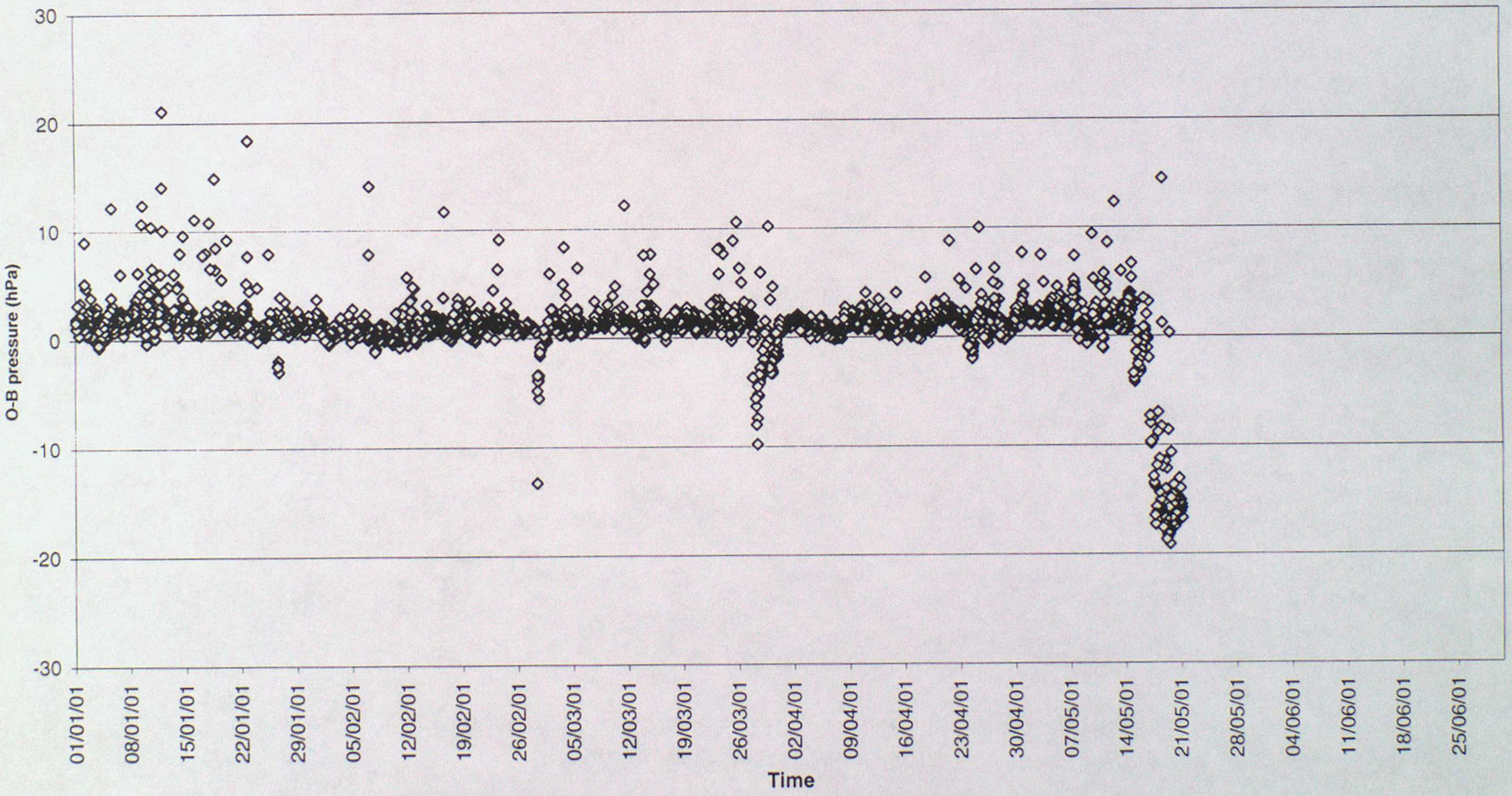
O-B pressure (hPa) for identifier 17546
Number of obs. plotted = 293    Number of outliers = 0



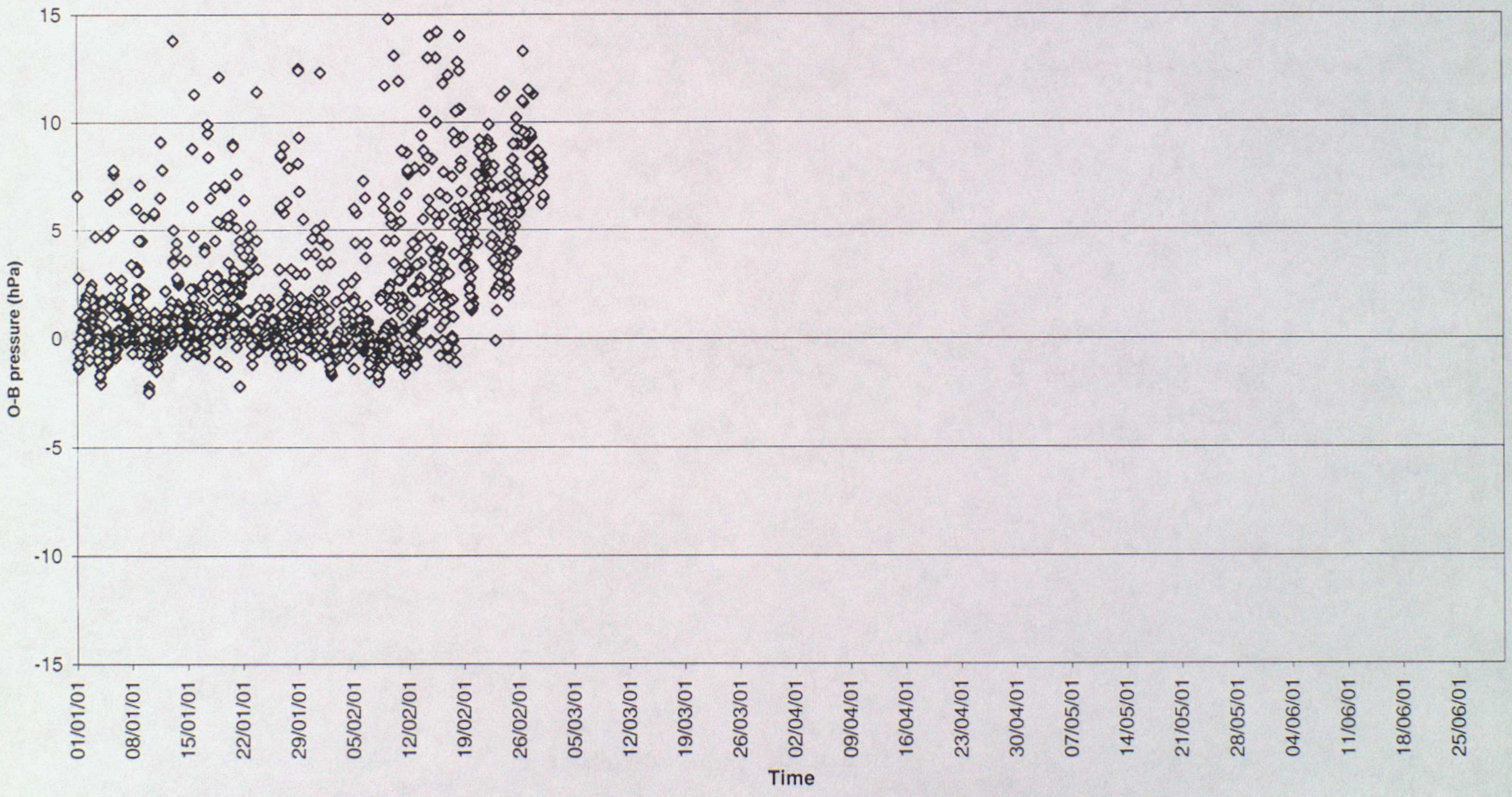
O-B pressure (hPa) for identifier 17601
Number of obs. plotted = 89    Number of outliers = 2

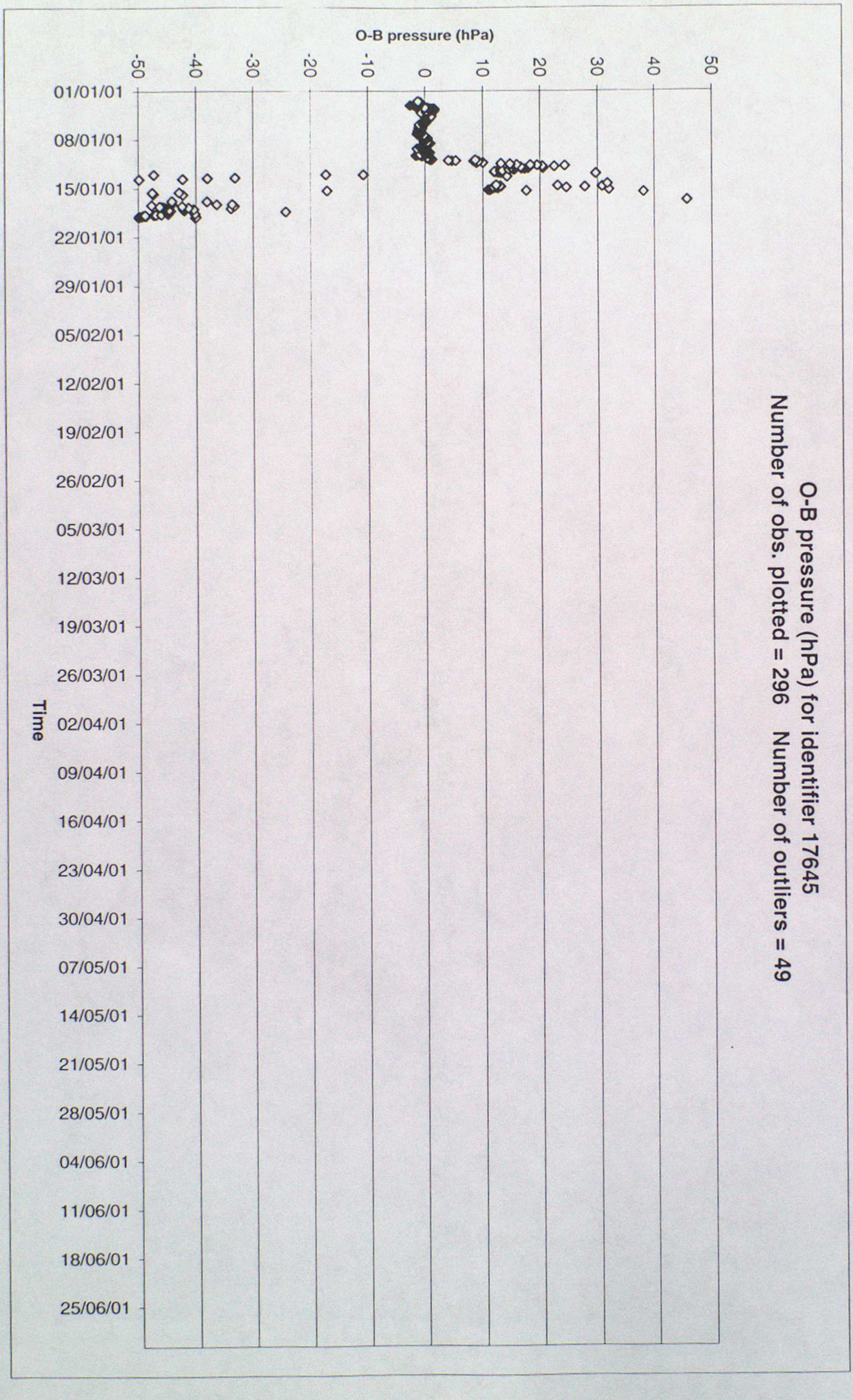


O-B pressure (hPa) for identifier 17639
Number of obs. plotted = 2591    Number of outliers = 0



O-B pressure (hPa) for identifier 17641
Number of obs. plotted = 1210    Number of outliers = 10

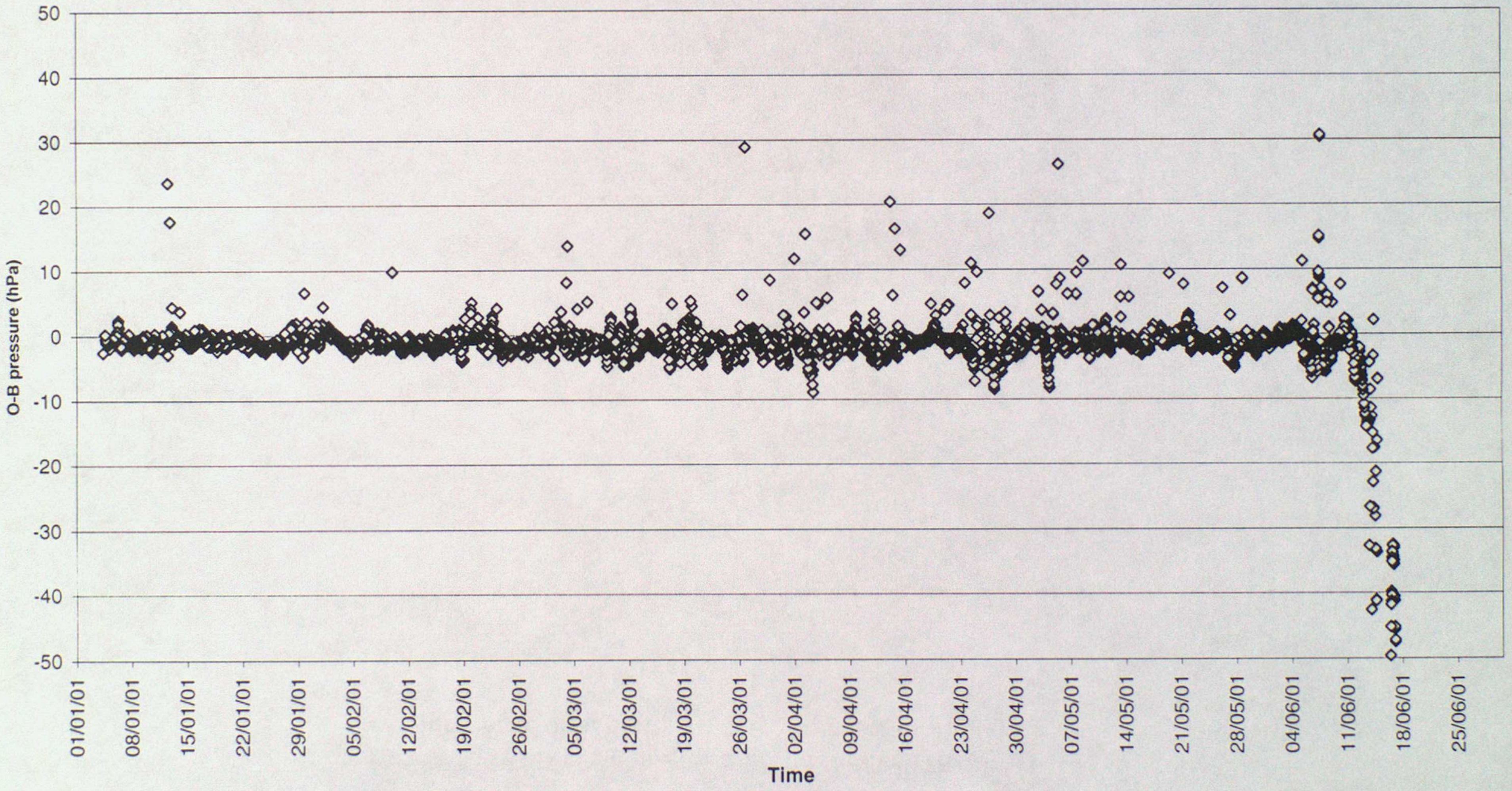


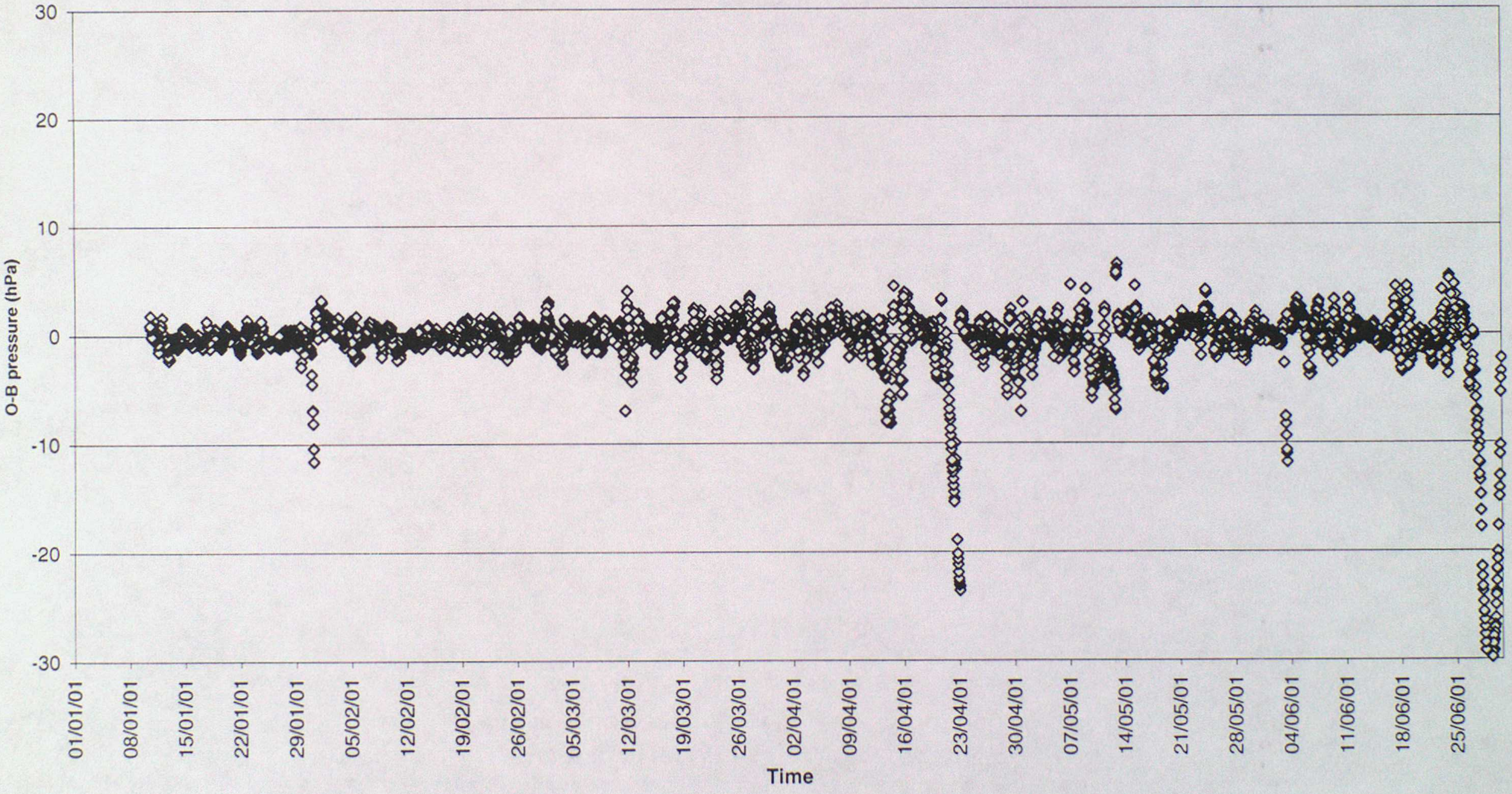


O-B pressure (hPa) for identifier 17645

Number of obs. plotted = 296    Number of outliers = 49

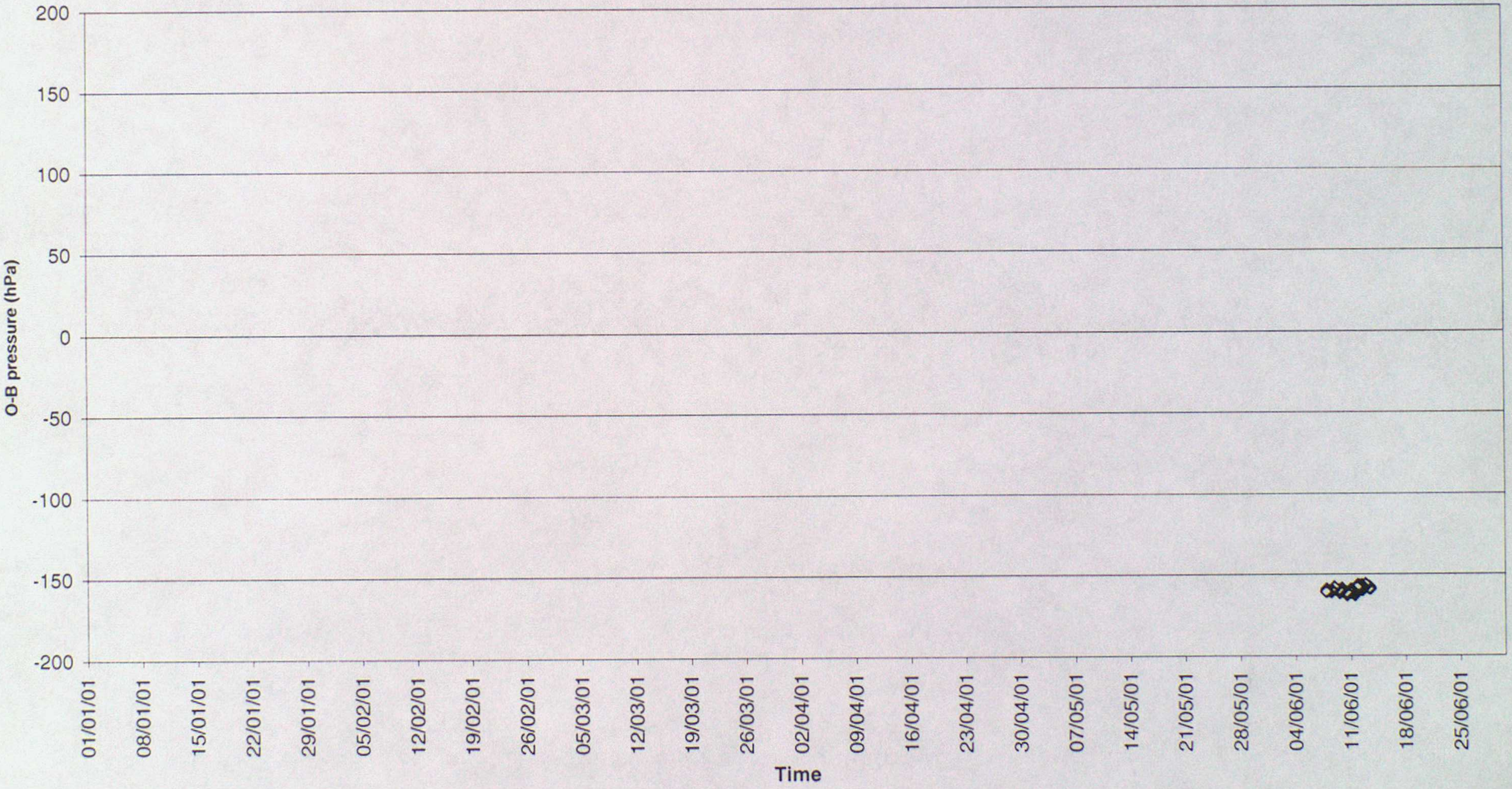
O-B pressure (hPa) for identifier 17646
Number of obs. plotted = 4059    Number of outliers = 63



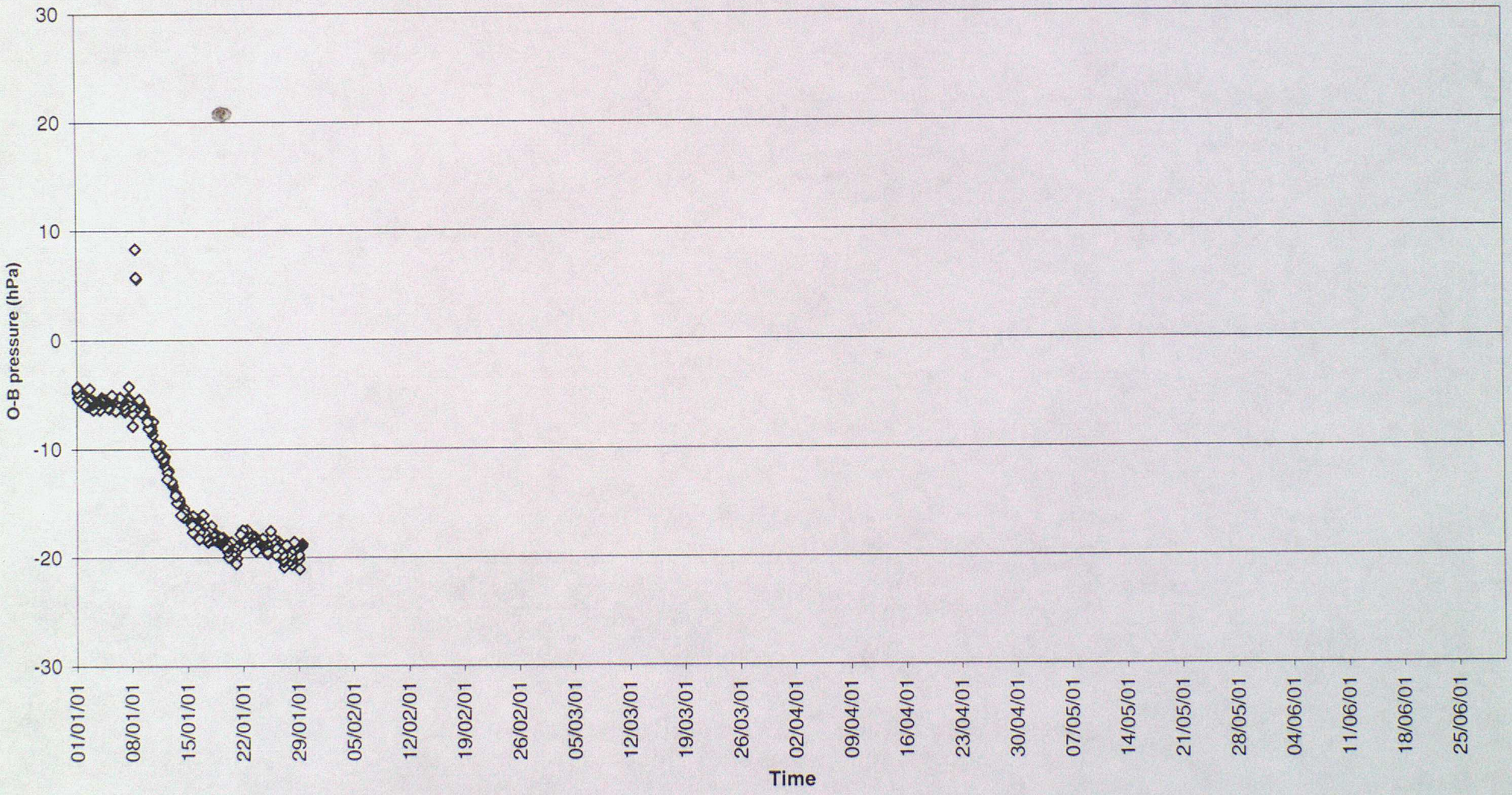


O-B pressure (hPa) for identifier 17647
Number of obs. plotted = 3651    Number of outliers = 19

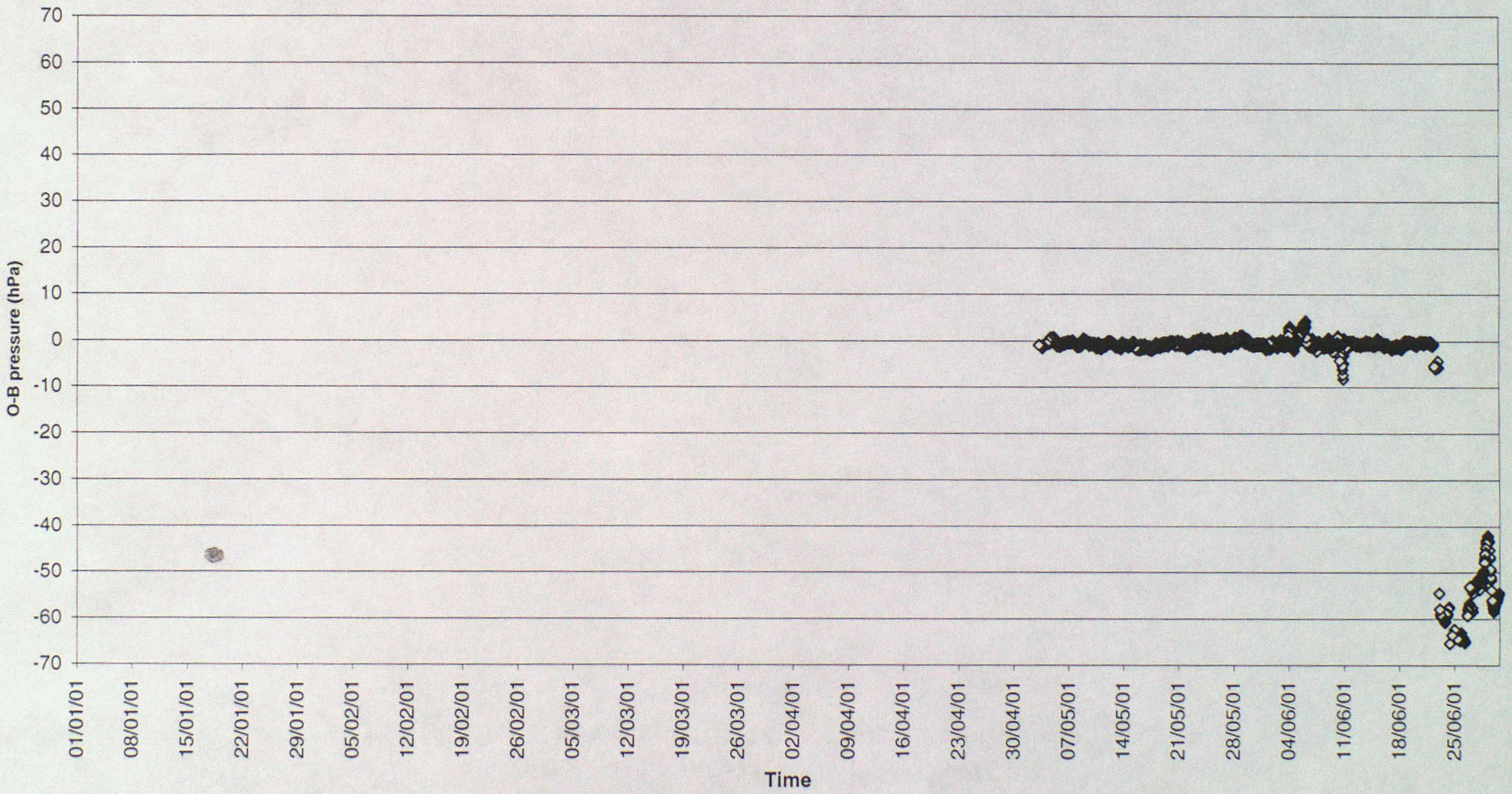
O-B pressure (hPa) for identifier 21604
Number of obs. plotted = 65    Number of outliers = 0



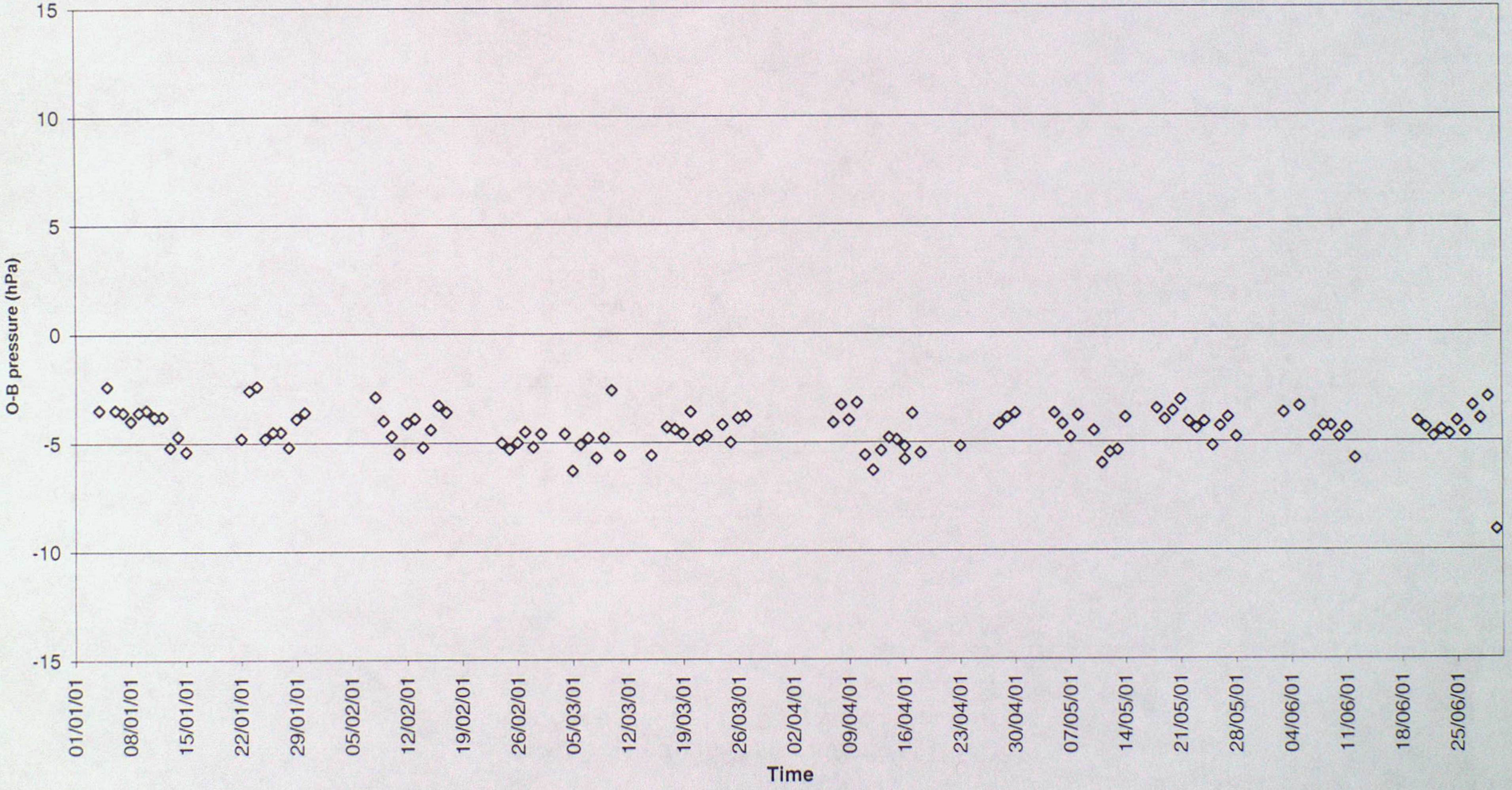
O-B pressure (hPa) for identifier 23933
Number of obs. plotted = 232    Number of outliers = 0

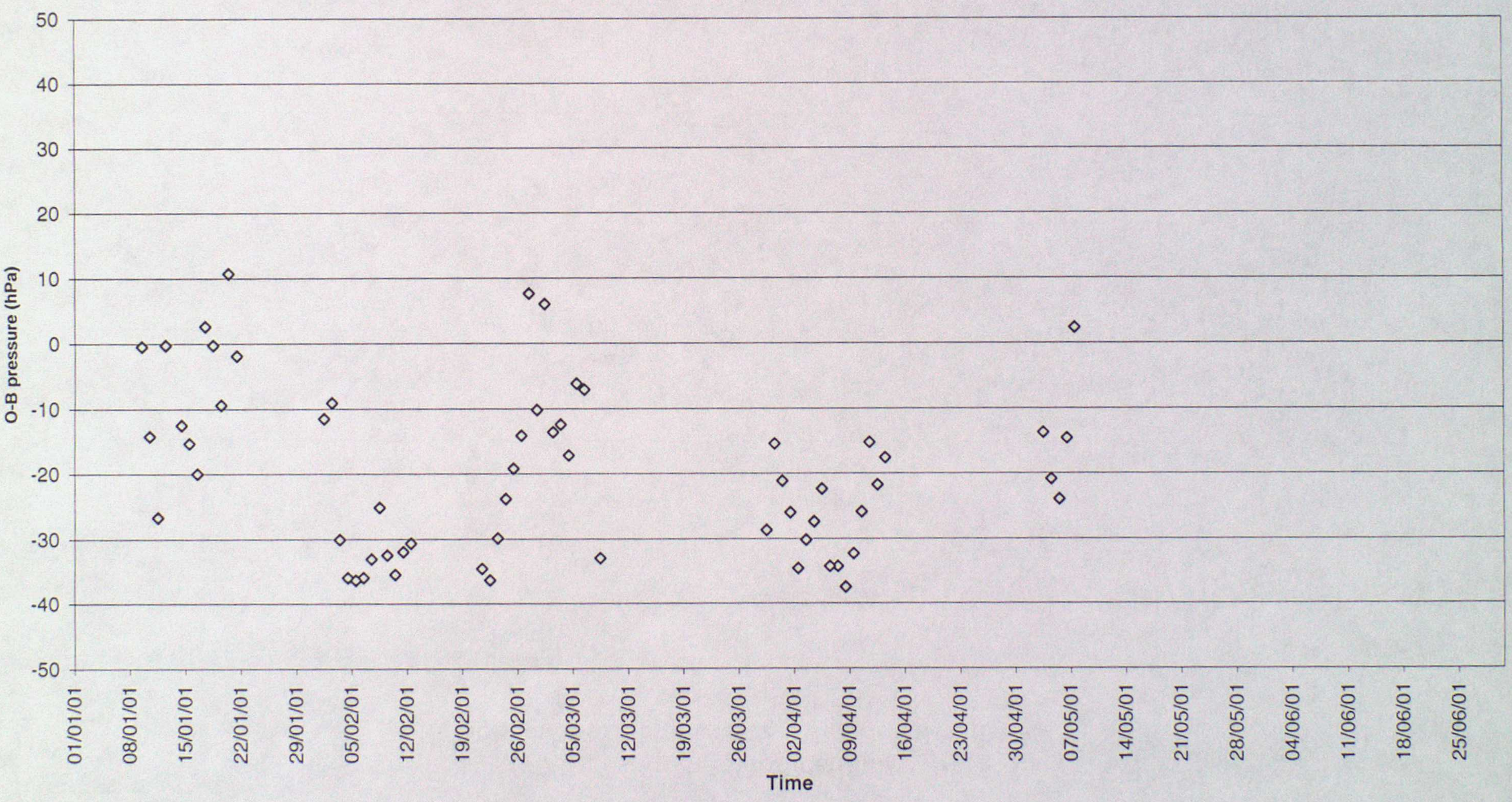


O-B pressure (hPa) for identifier 25540
Number of obs. plotted = 1439    Number of outliers = 0



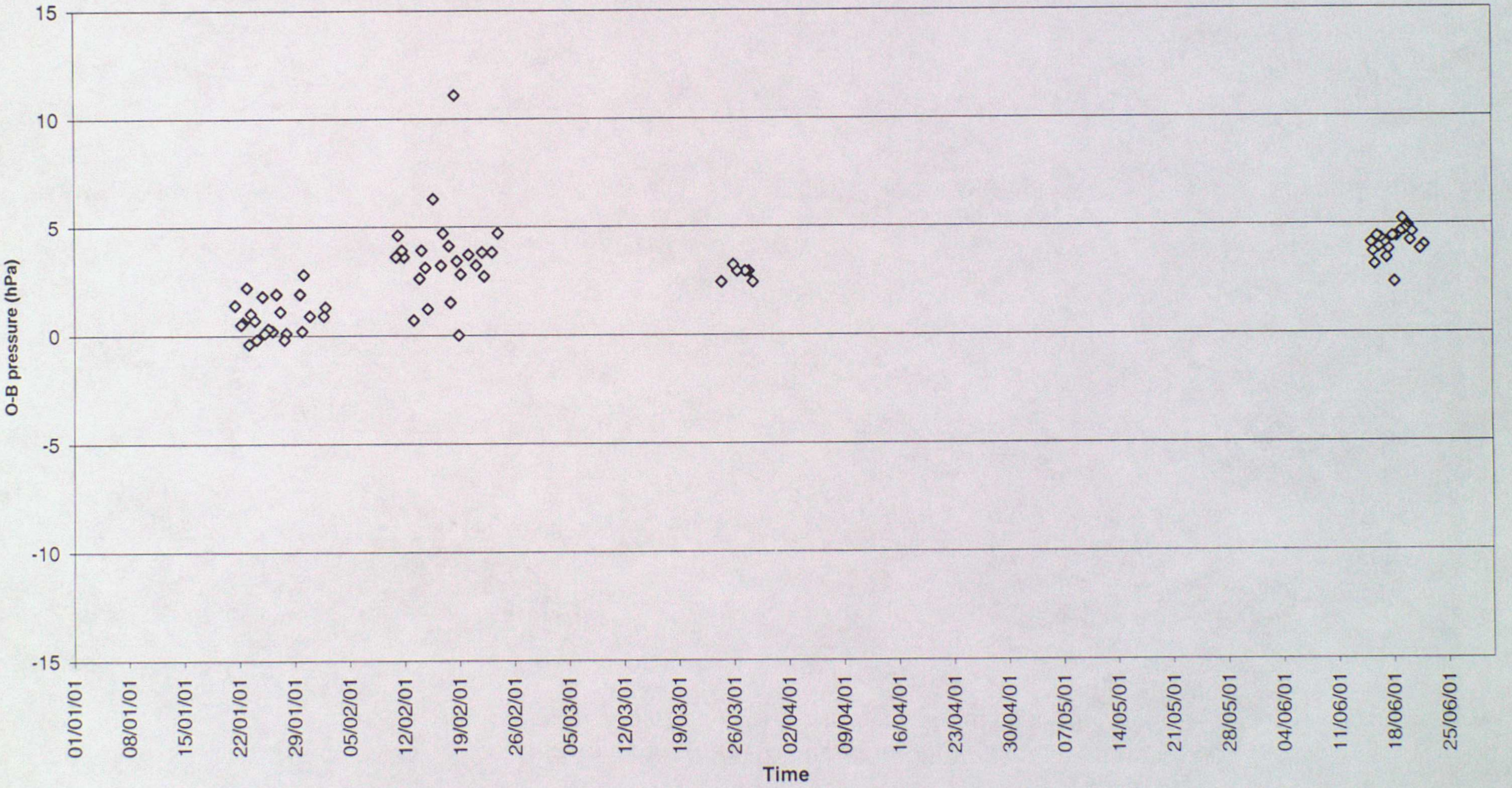
O-B pressure (hPa) for identifier 3FHF8
Number of obs. plotted = 112    Number of outliers = 0

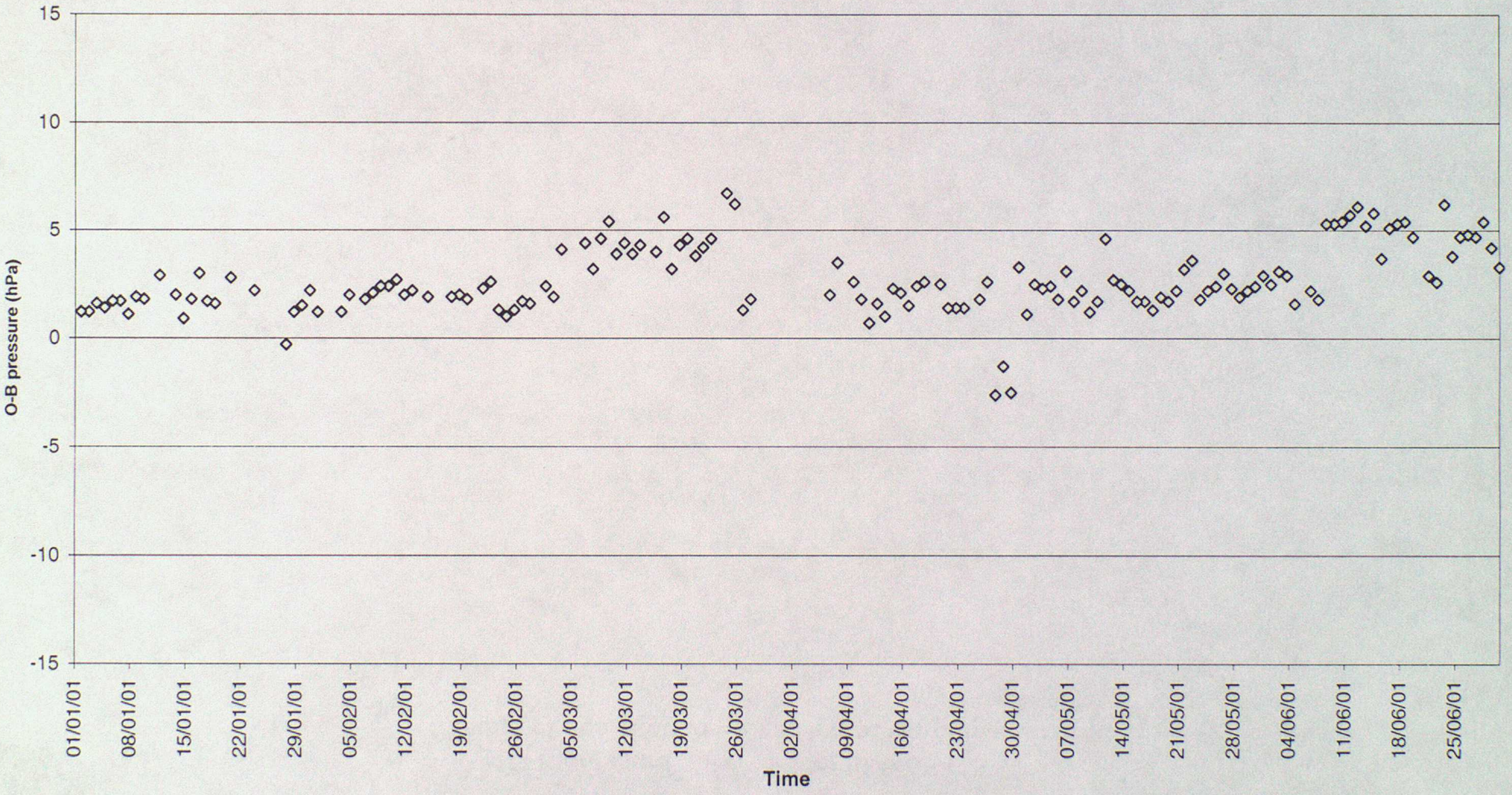




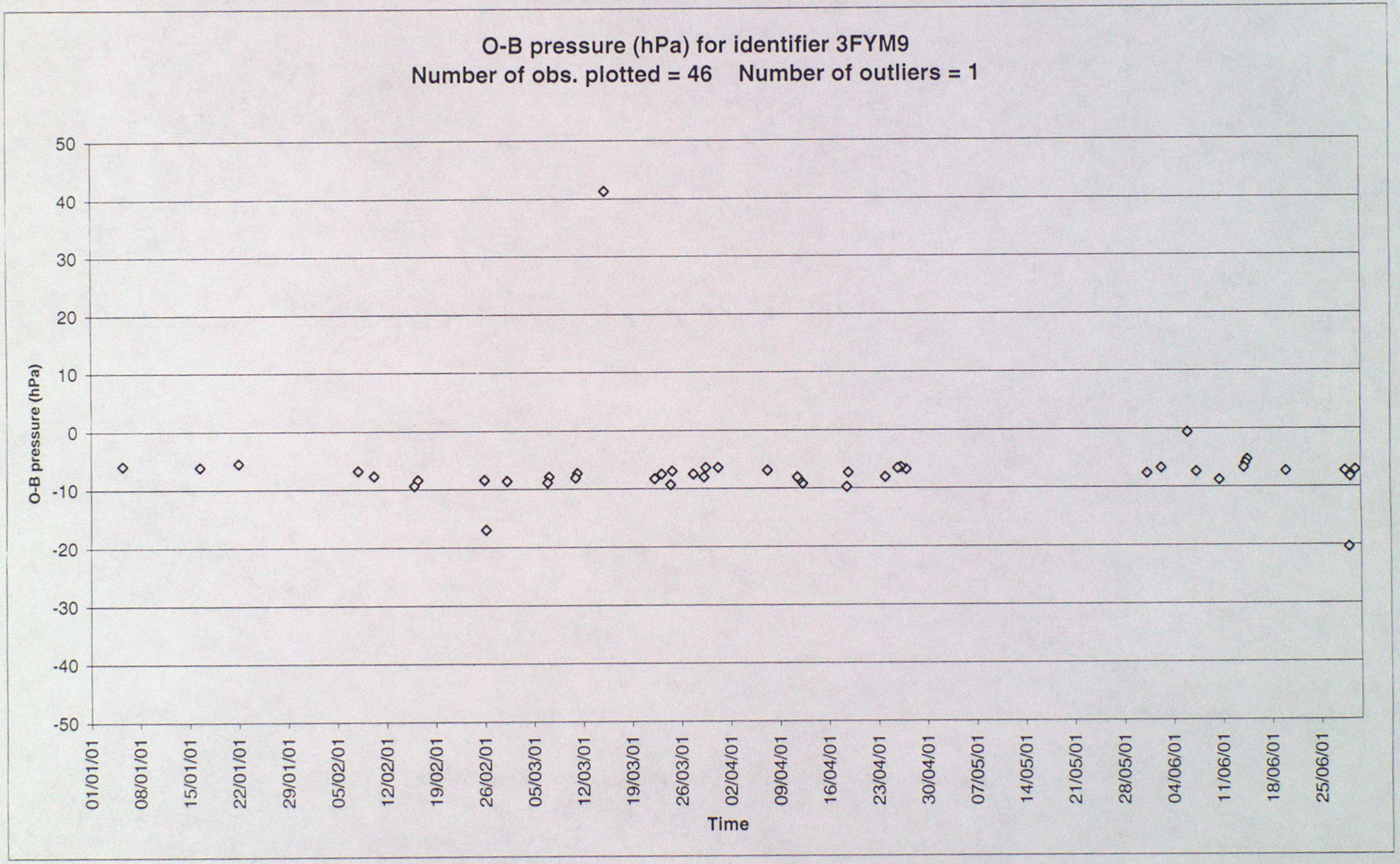
O-B pressure (hPa) for identifier 3FPA6
Number of obs. plotted = 60    Number of outliers = 0

O-B pressure (hPa) for identifier 3FRT5
Number of obs. plotted = 73    Number of outliers = 0

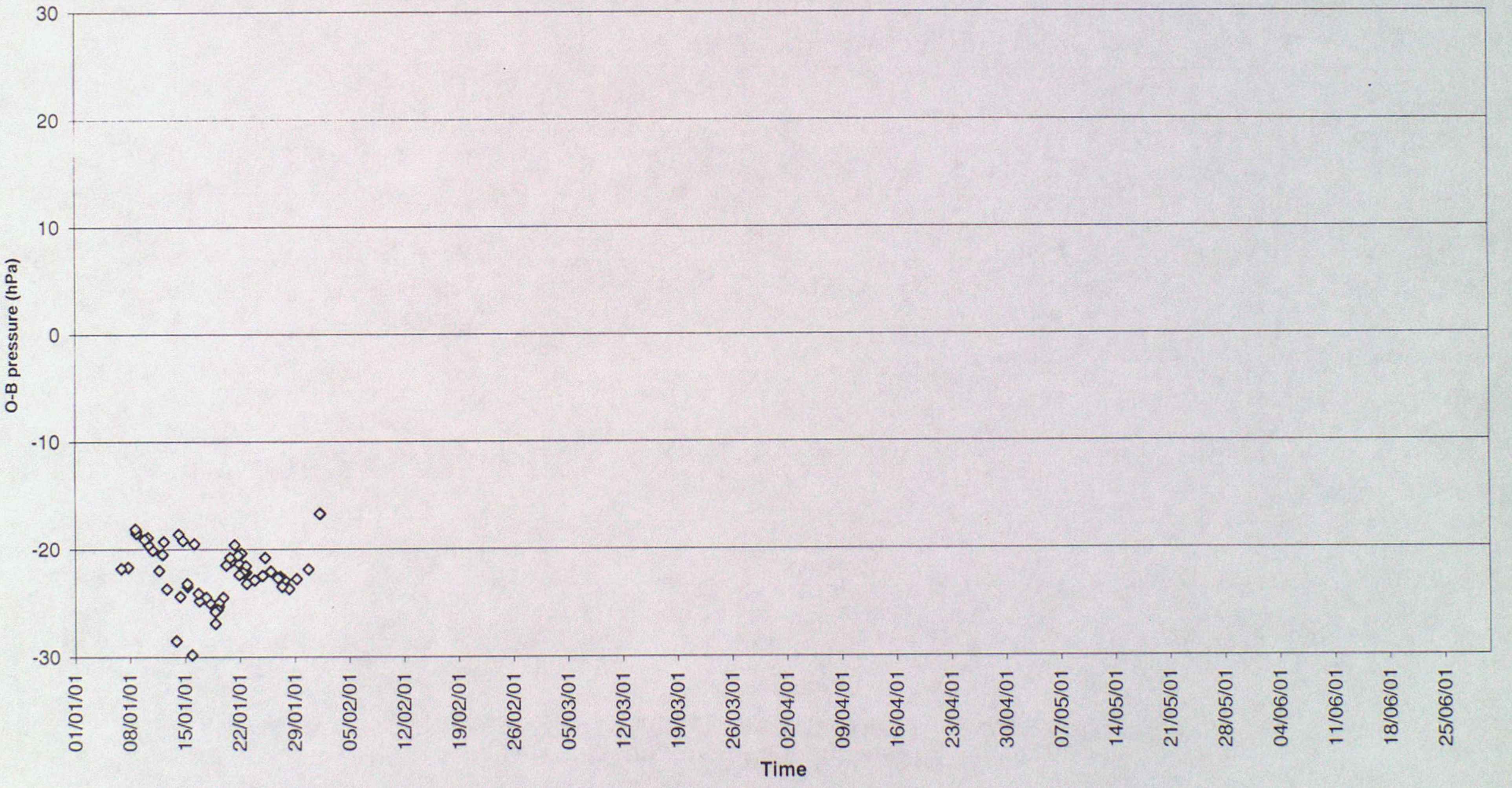




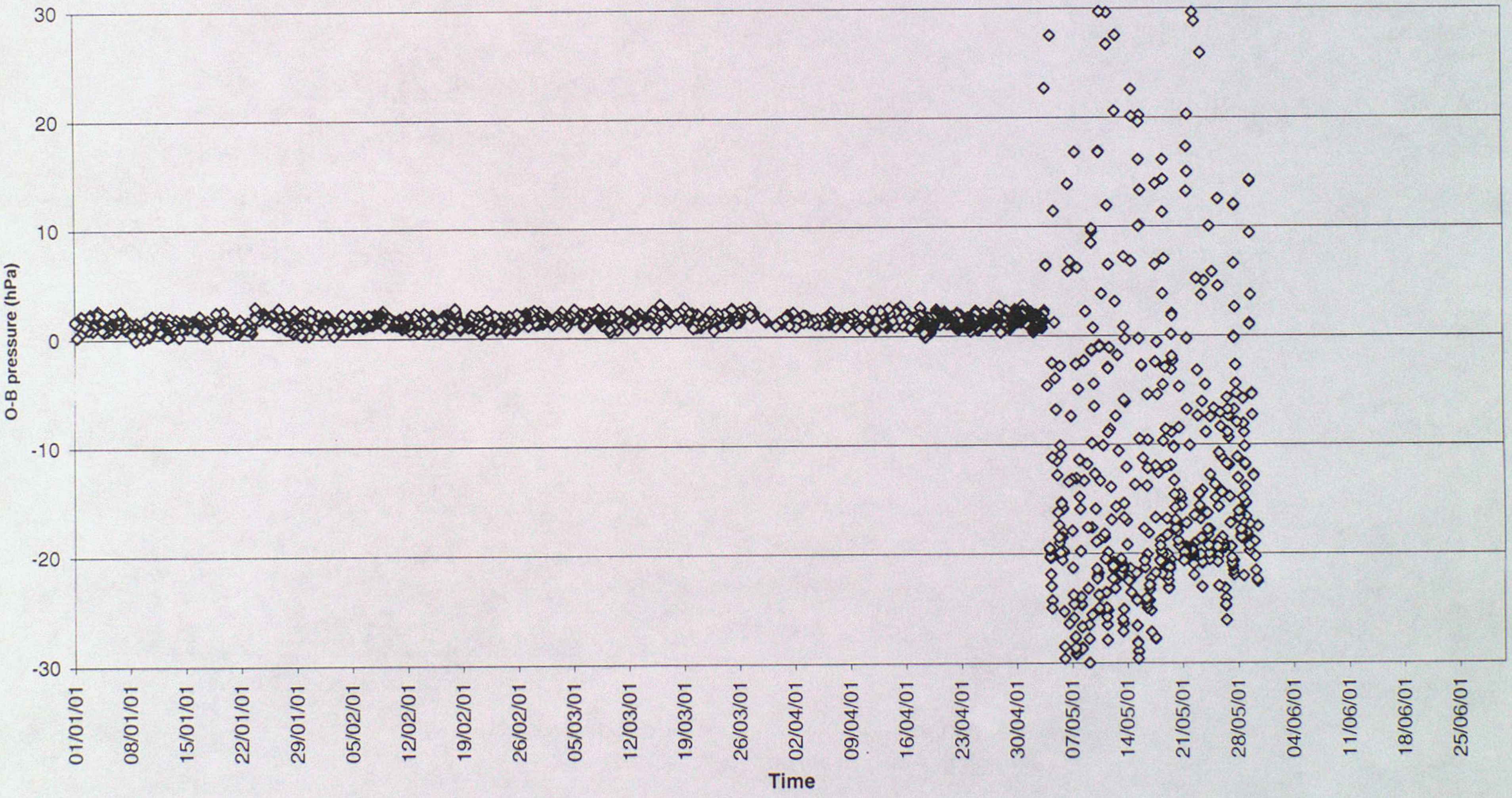
O-B pressure (hPa) for identifier 3FWP3
Number of obs. plotted = 147    Number of outliers = 0


O-B pressure (hPa) for identifier 3FYM9
Number of obs. plotted = 46 Number of outliers = 1
O-B pressure (hPa)
50
40
30
20
10
0
-10
-20
-30
-40
-50
01/01/01
08/01/01
15/01/01
22/01/01
29/01/01
05/02/01
12/02/01
19/02/01
26/02/01
05/03/01
12/03/01
19/03/01
26/03/01
02/04/01
09/04/01
16/04/01
23/04/01
30/04/01
07/05/01
14/05/01
21/05/01
28/05/01
04/06/01
11/06/01
18/06/01
25/06/01
Time

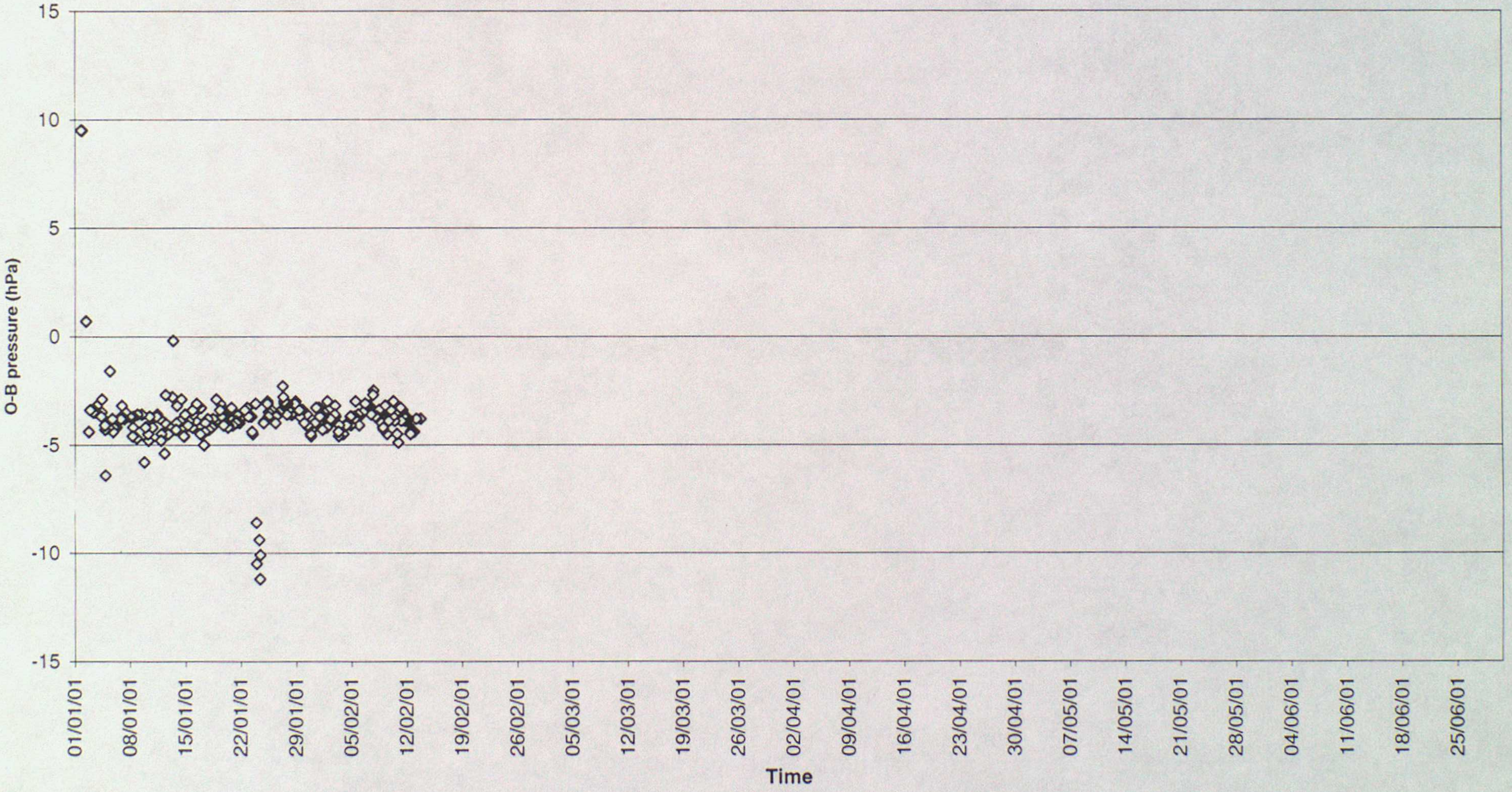
O-B pressure (hPa) for identifier 31526
Number of obs. plotted = 56    Number of outliers = 0

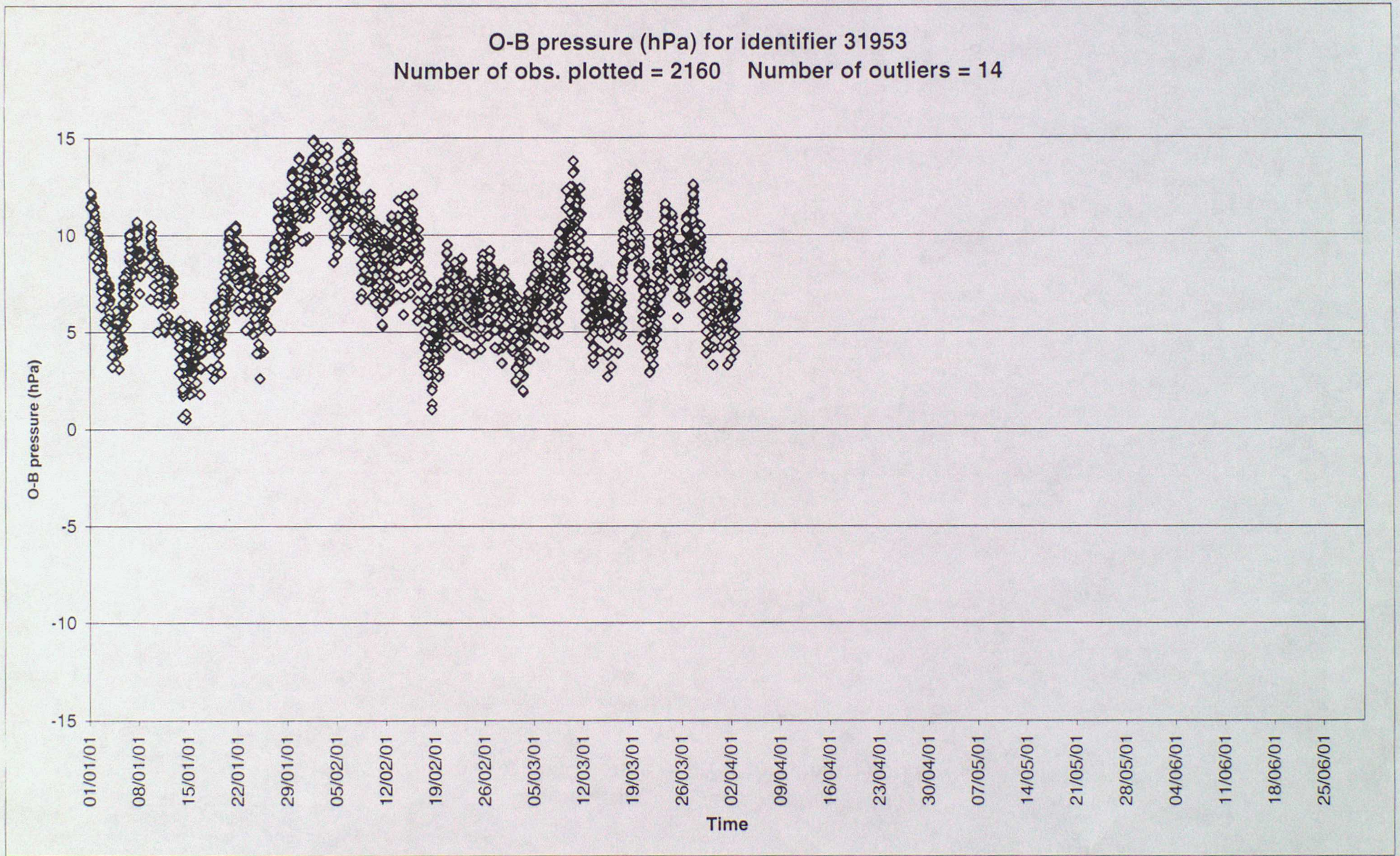


O-B pressure (hPa) for identifier 31535
Number of obs. plotted = 1921    Number of outliers = 102



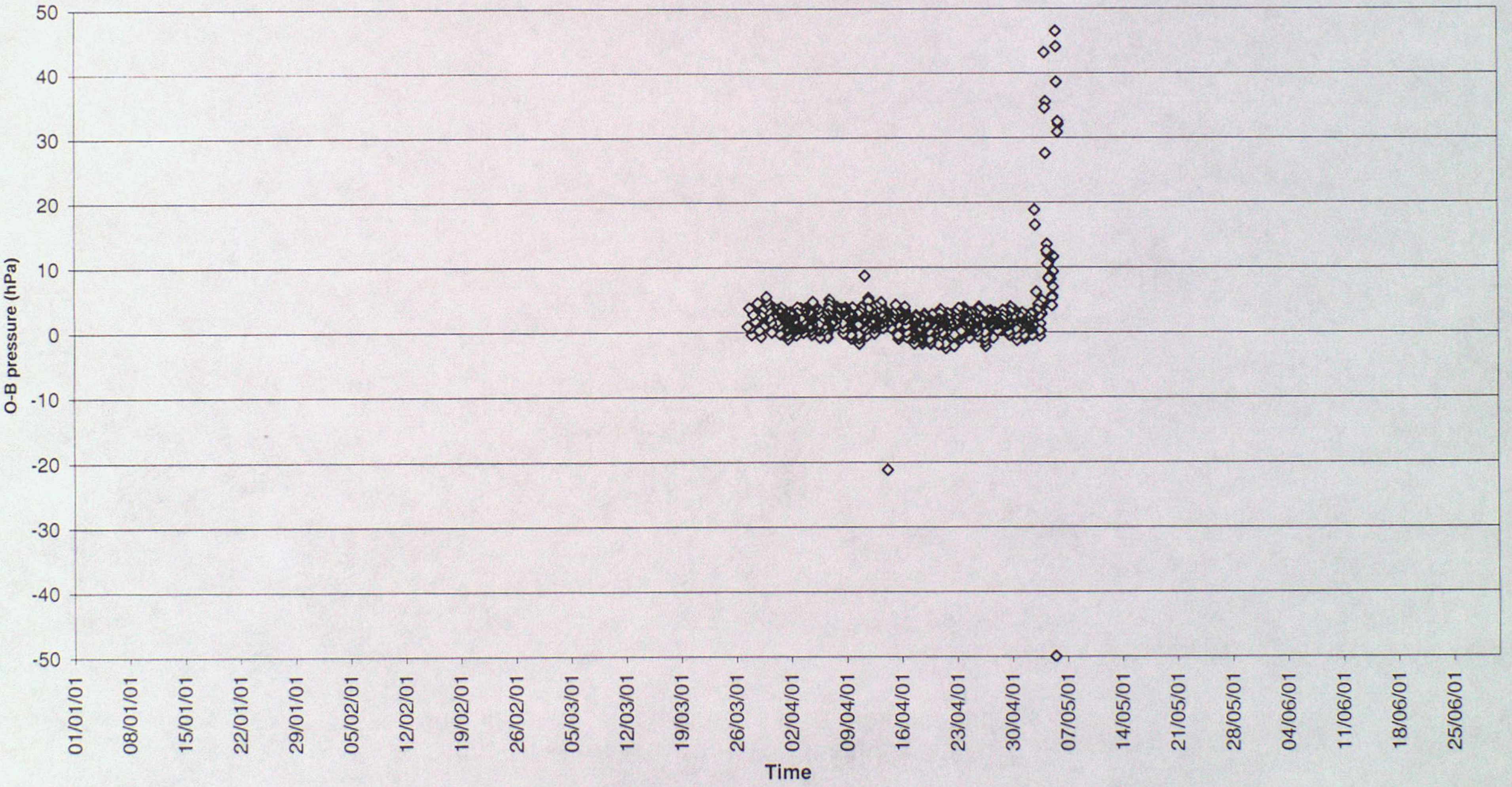
O-B pressure (hPa) for identifier 31537
Number of obs. plotted = 217    Number of outliers = 0

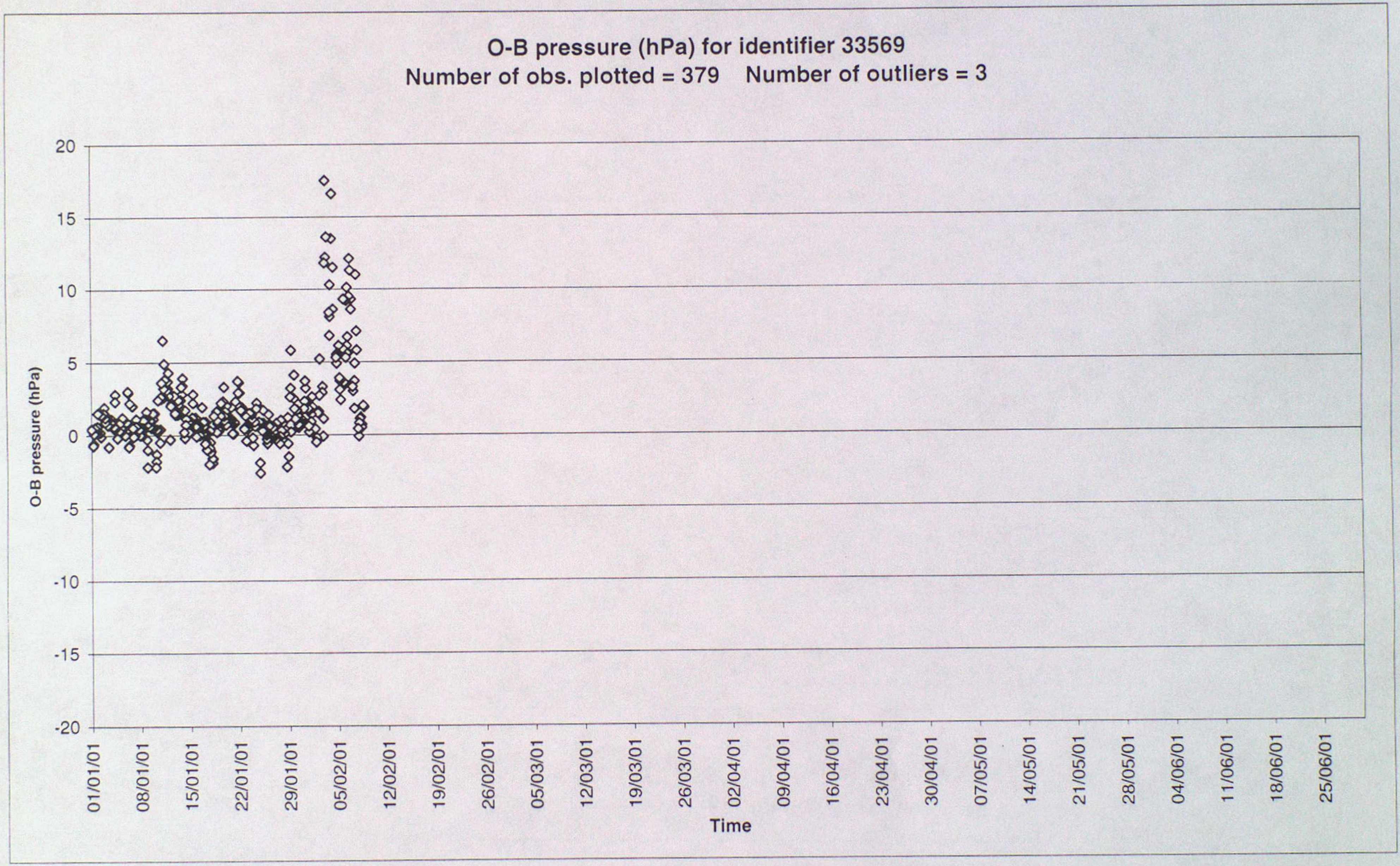




O-B pressure (hPa) for identifier 31953
Number of obs. plotted = 2160    Number of outliers = 14

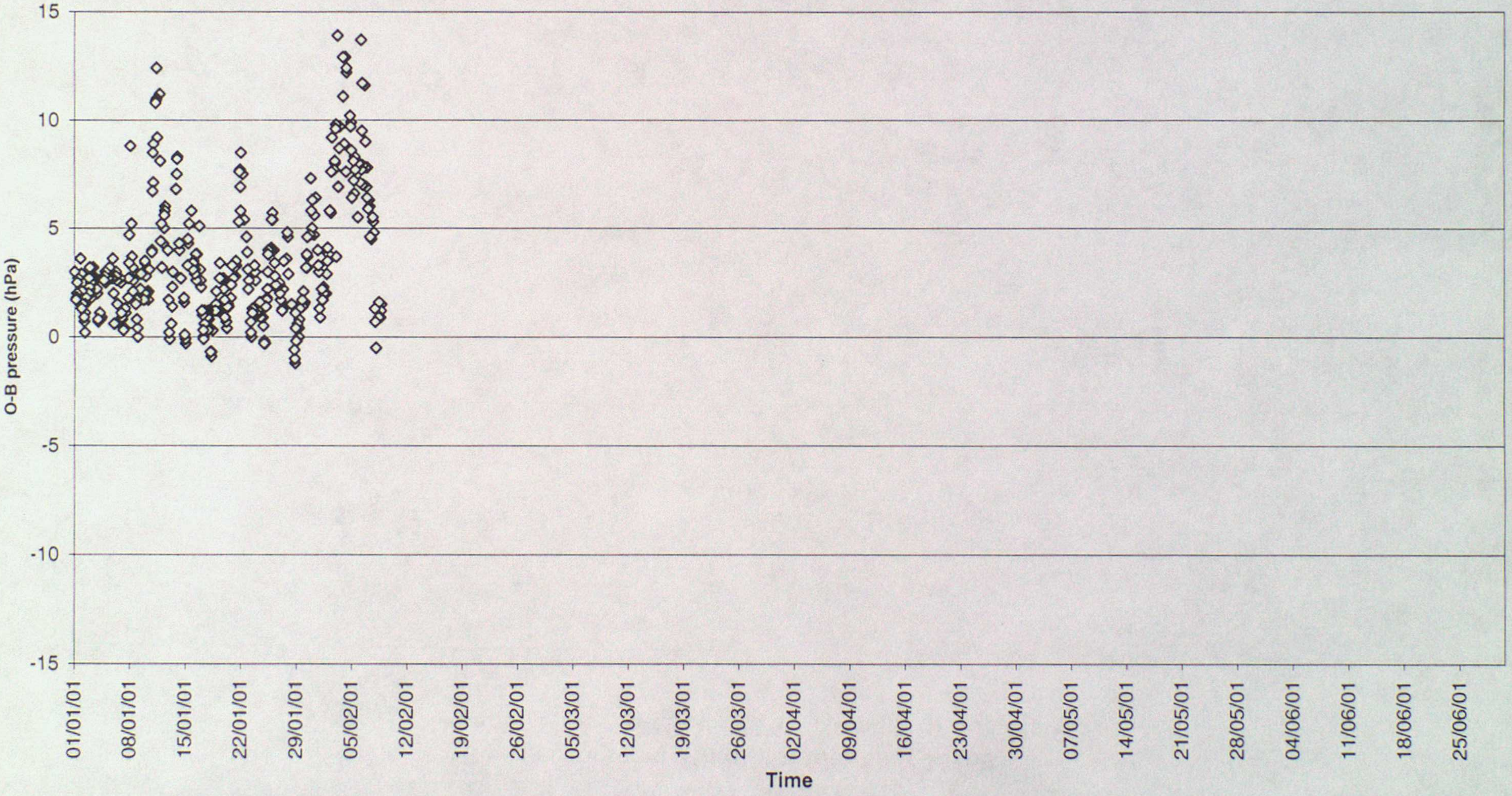
O-B pressure (hPa) for identifier 31980
Number of obs. plotted = 597    Number of outliers = 2

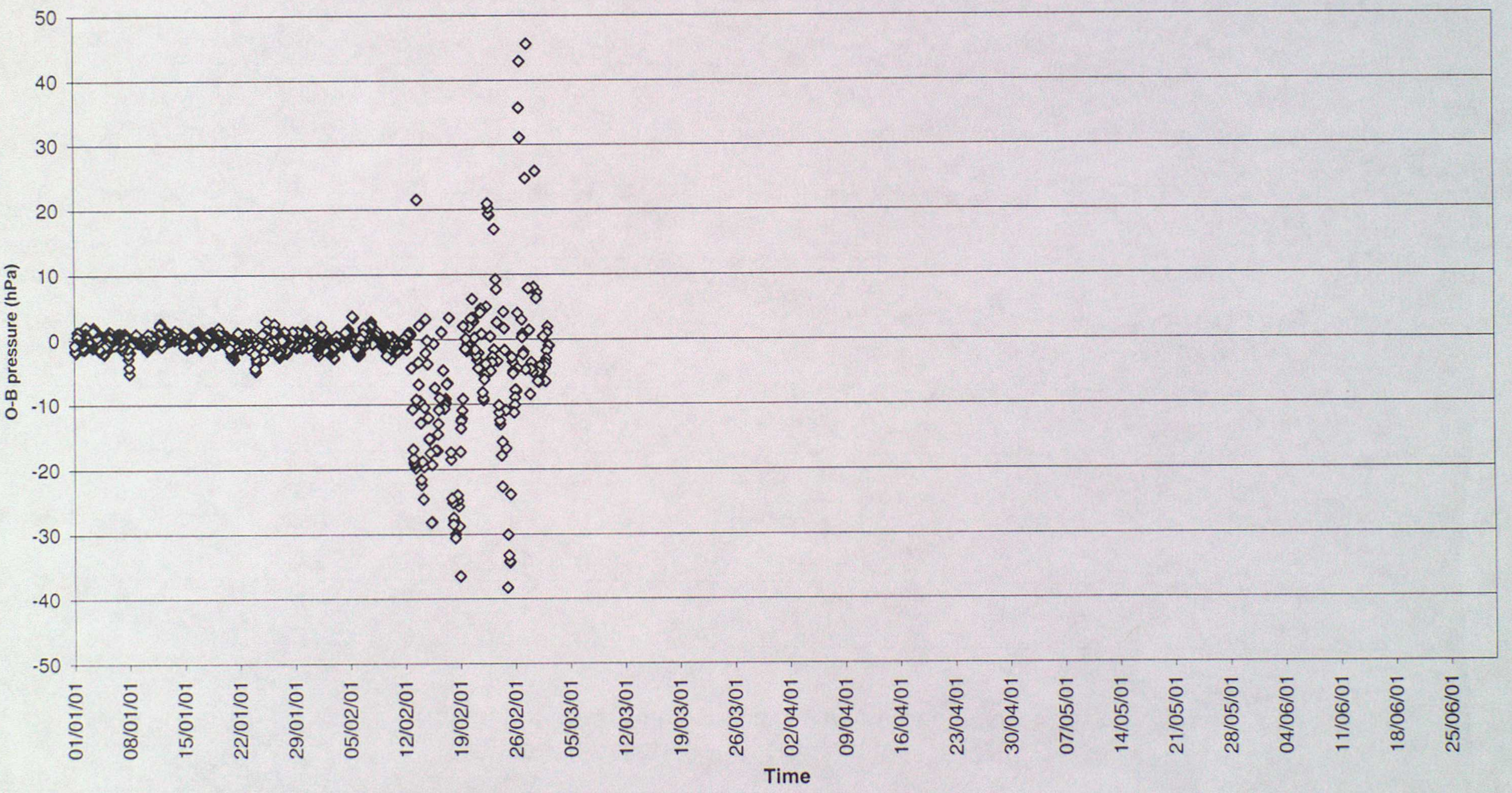




O-B pressure (hPa) for identifier 33569
Number of obs. plotted = 379    Number of outliers = 3

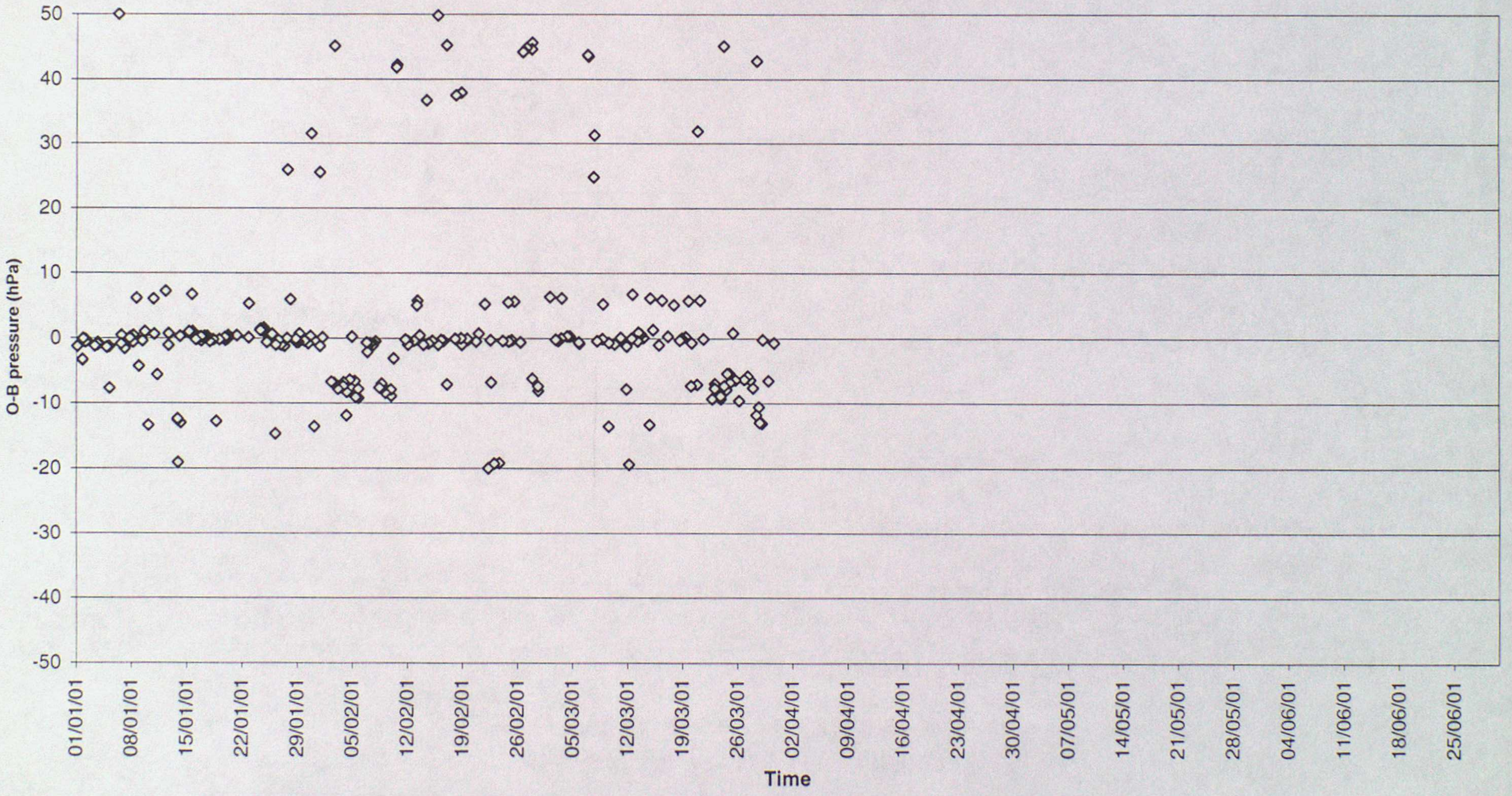
O-B pressure (hPa) for identifier 33570
Number of obs. plotted = 373    Number of outliers = 2



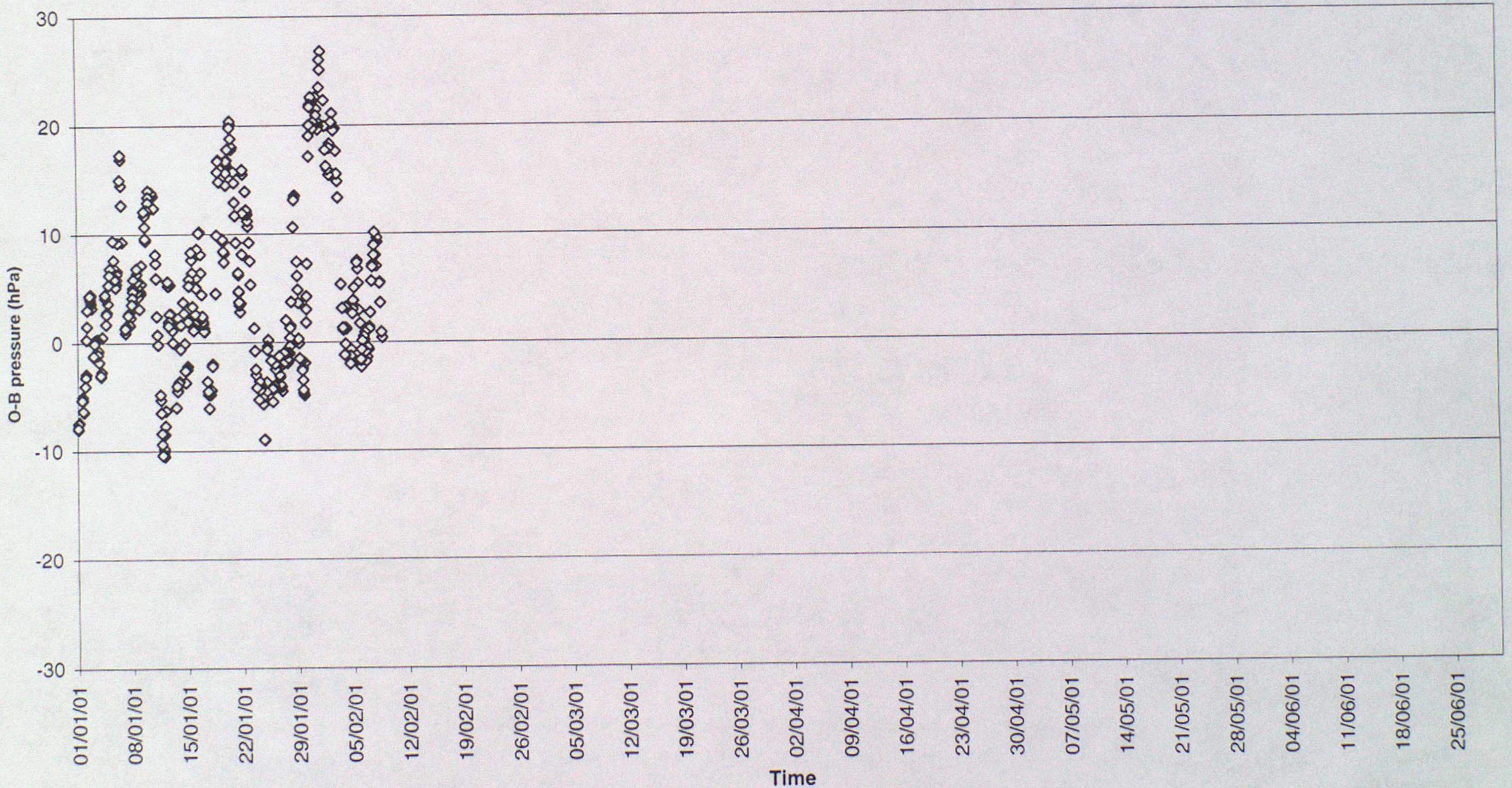


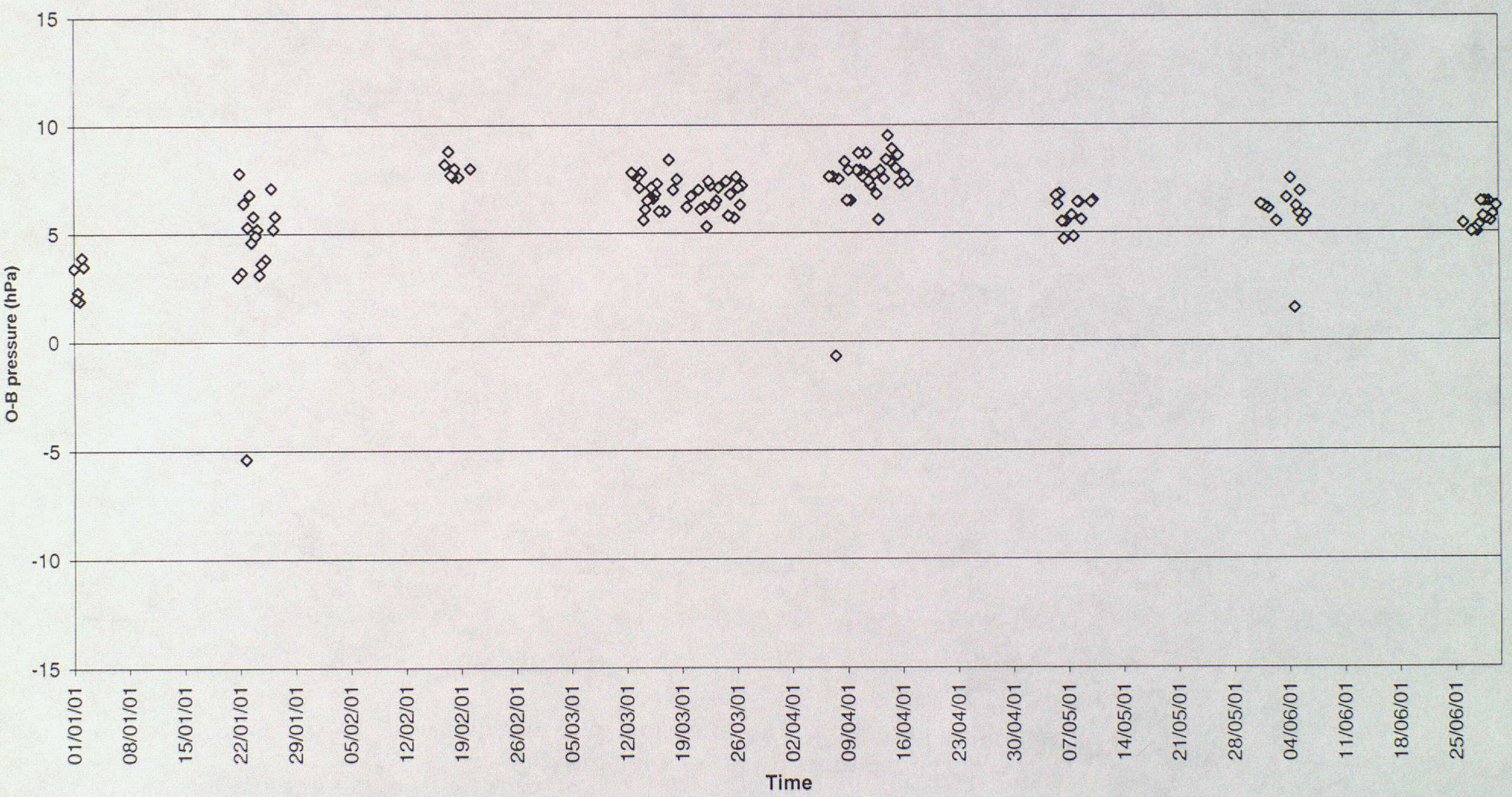
O-B pressure (hPa) for identifier 33571
Number of obs. plotted = 728    Number of outliers = 1

O-B pressure (hPa) for identifier 33622
Number of obs. plotted = 238    Number of outliers = 24



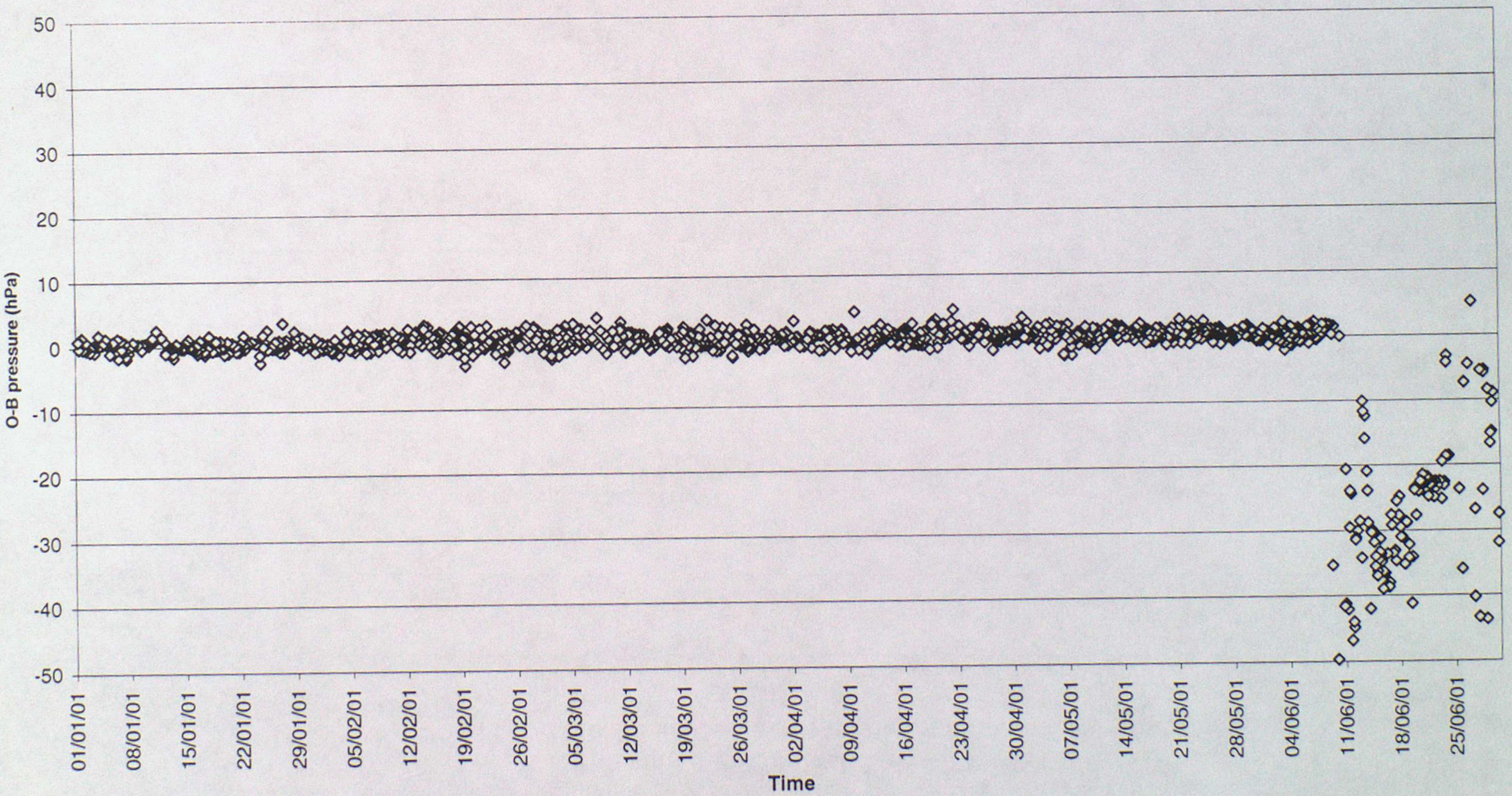
O-B pressure (hPa) for identifier 33953
Number of obs. plotted = 449    Number of outliers = 0

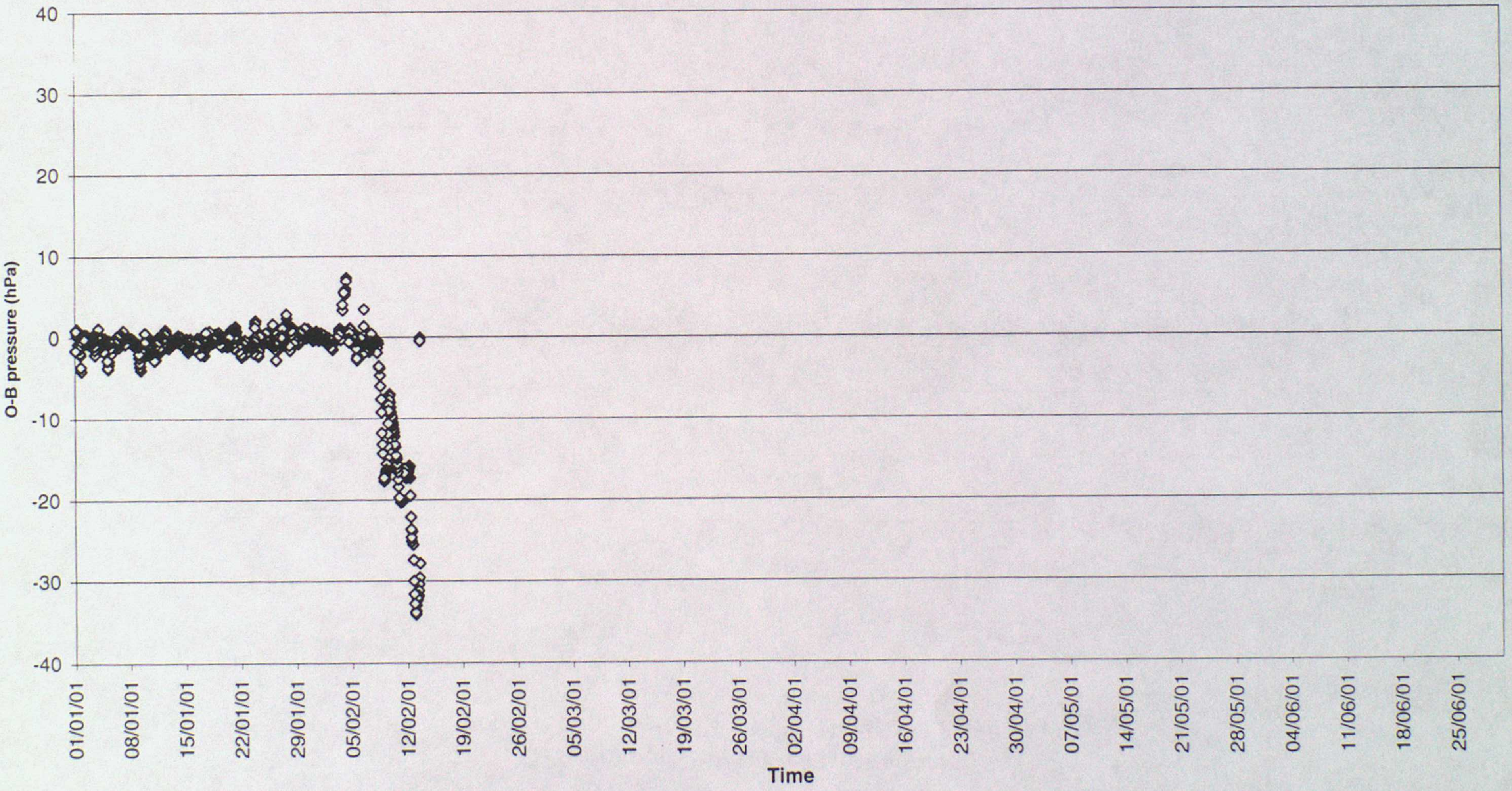




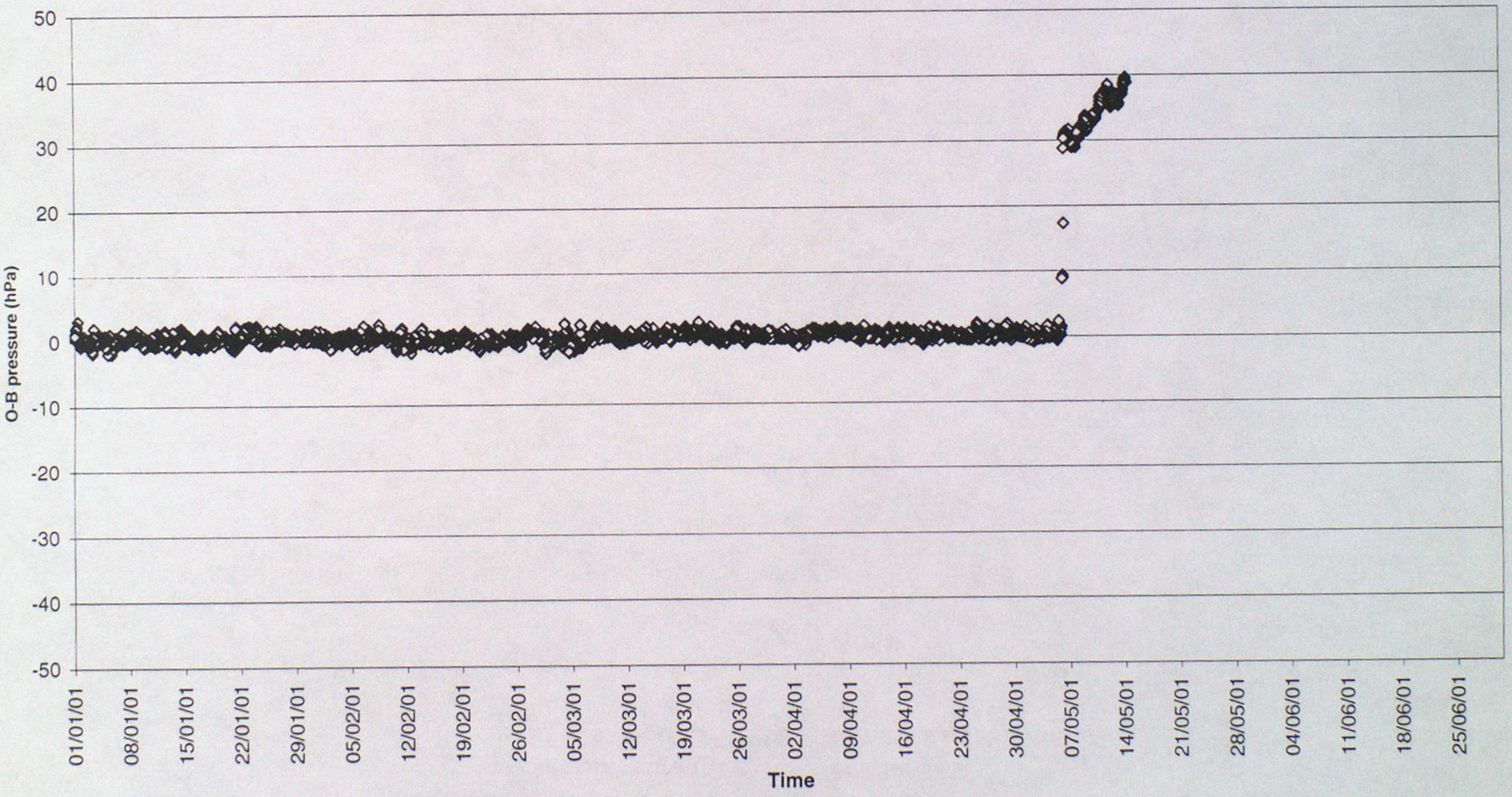
O-B pressure (hPa) for identifier 4XGV
Number of obs. plotted = 135    Number of outliers = 1

O-B pressure (hPa) for identifier 41504
Number of obs. plotted = 1058    Number of outliers = 6



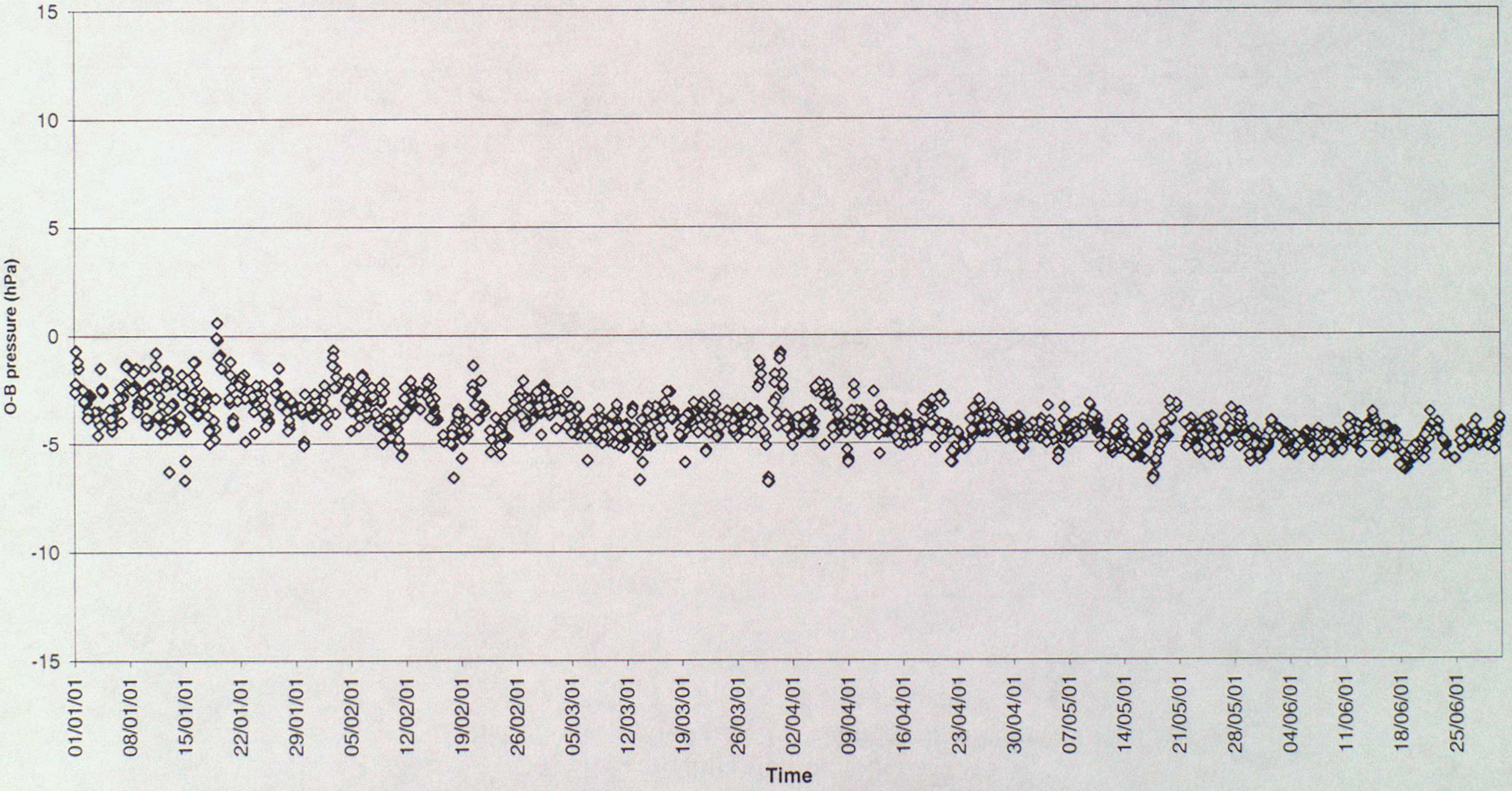


O-B pressure (hPa) for identifier 44723
Number of obs. plotted = 762    Number of outliers = 0

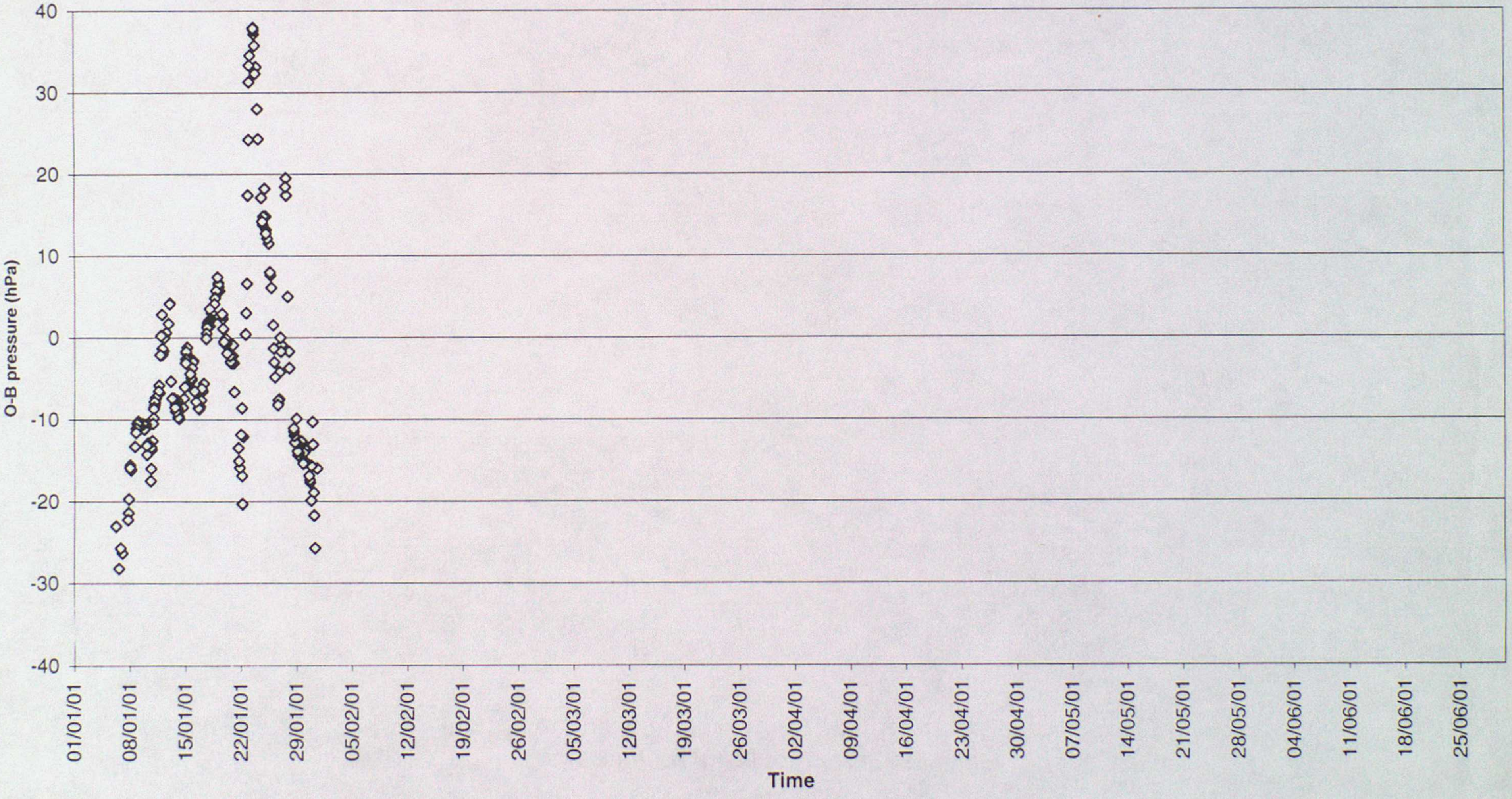


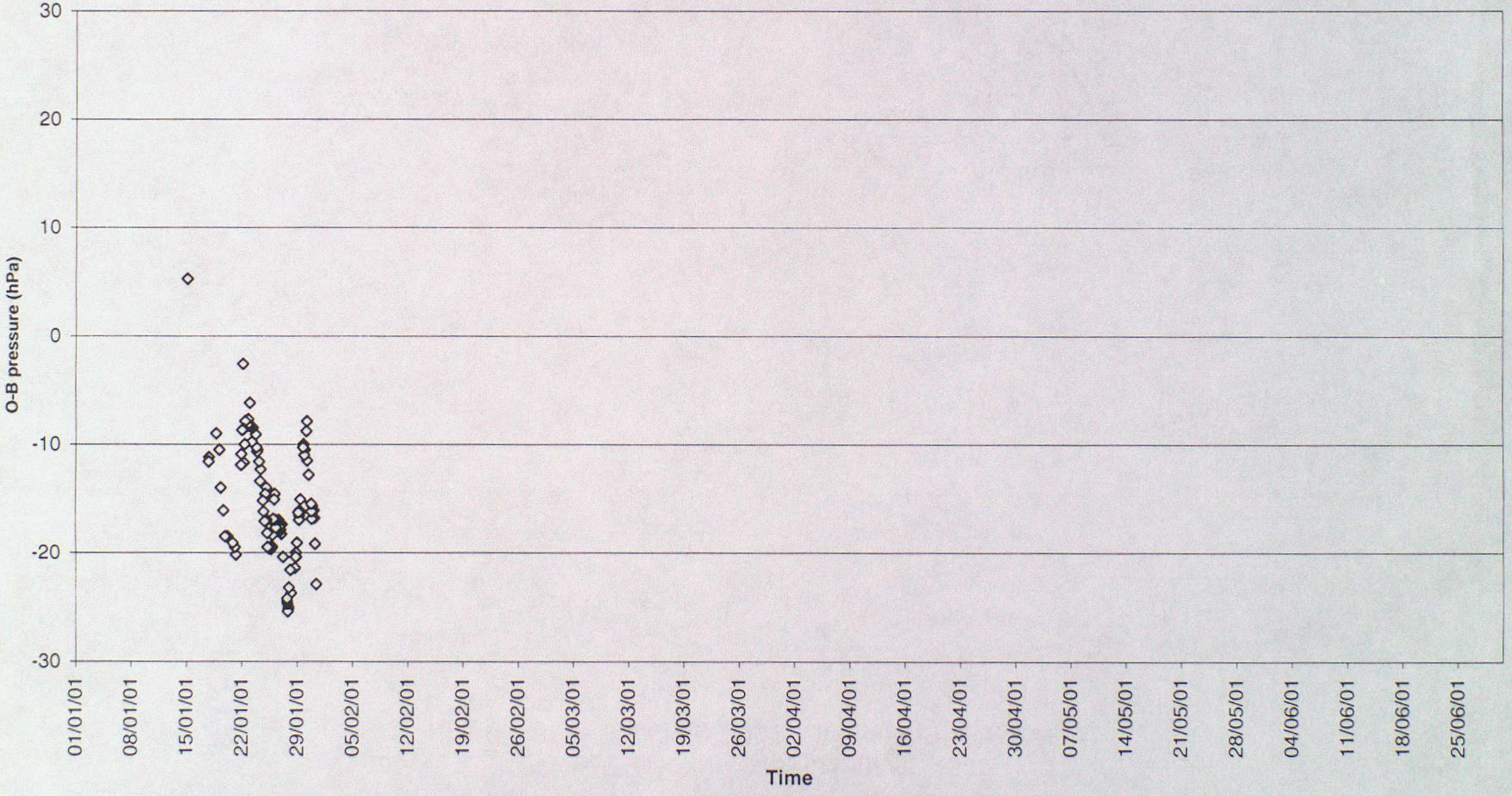
O-B pressure (hPa) for identifier 44724
Number of obs. plotted = 2828    Number of outliers = 0

O-B pressure (hPa) for identifier 46561
Number of obs. plotted = 1282    Number of outliers = 0



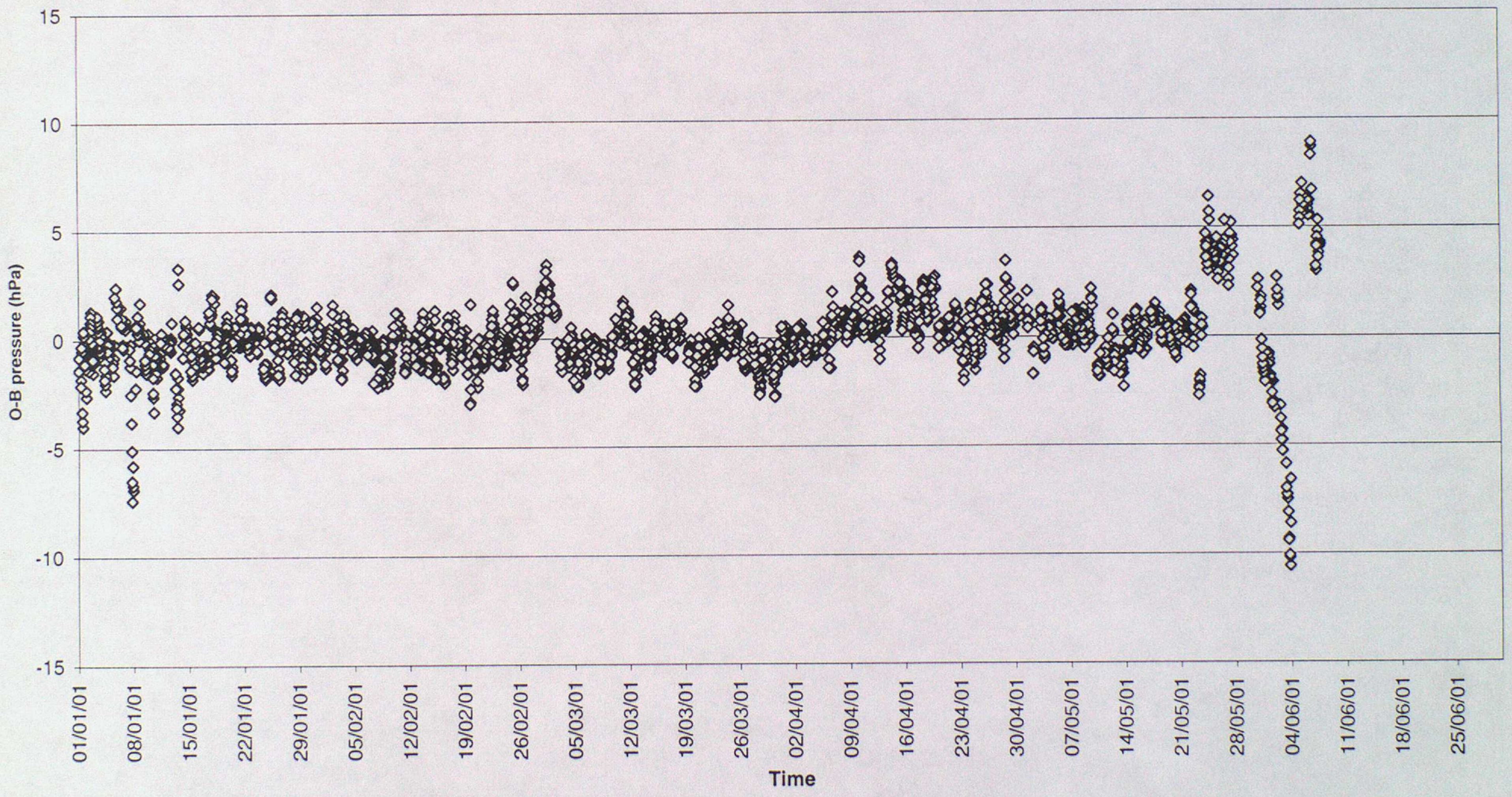
O-B pressure (hPa) for identifier 46585
Number of obs. plotted = 251    Number of outliers = 0



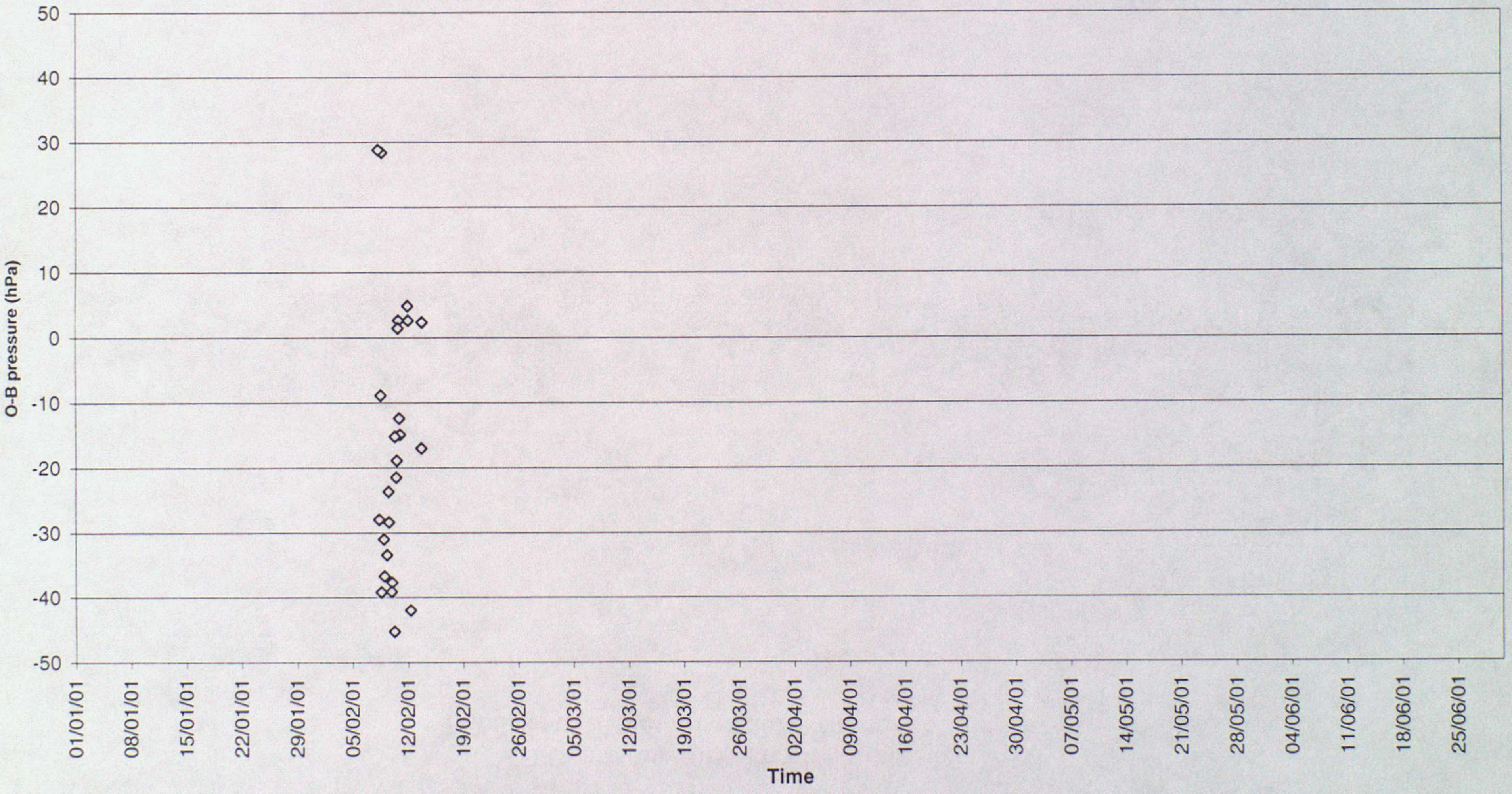


O-B pressure (hPa) for identifier 46624
Number of obs. plotted = 109    Number of outliers = 0

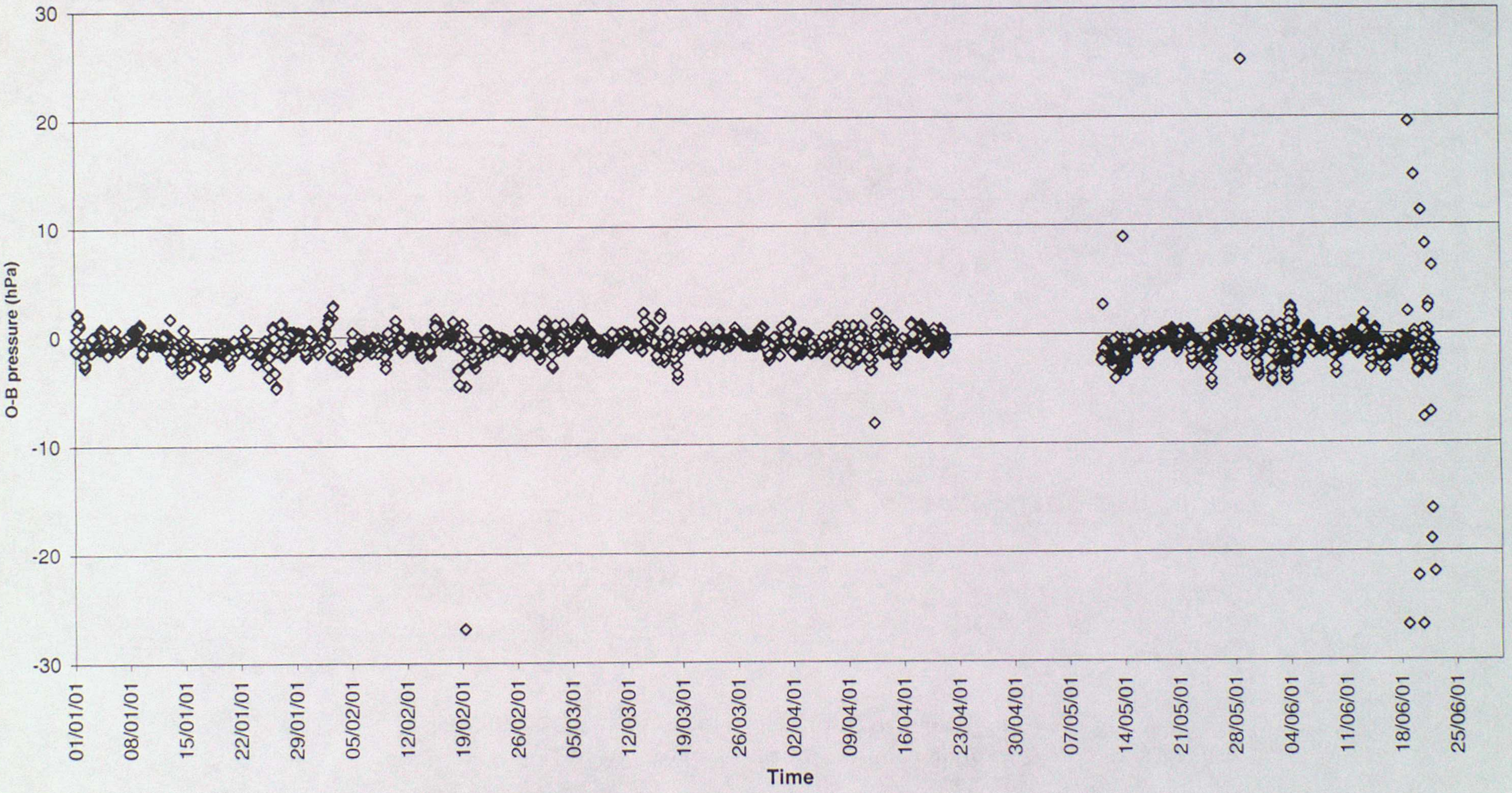
O-B pressure (hPa) for identifier 48581
Number of obs. plotted = 2207    Number of outliers = 0



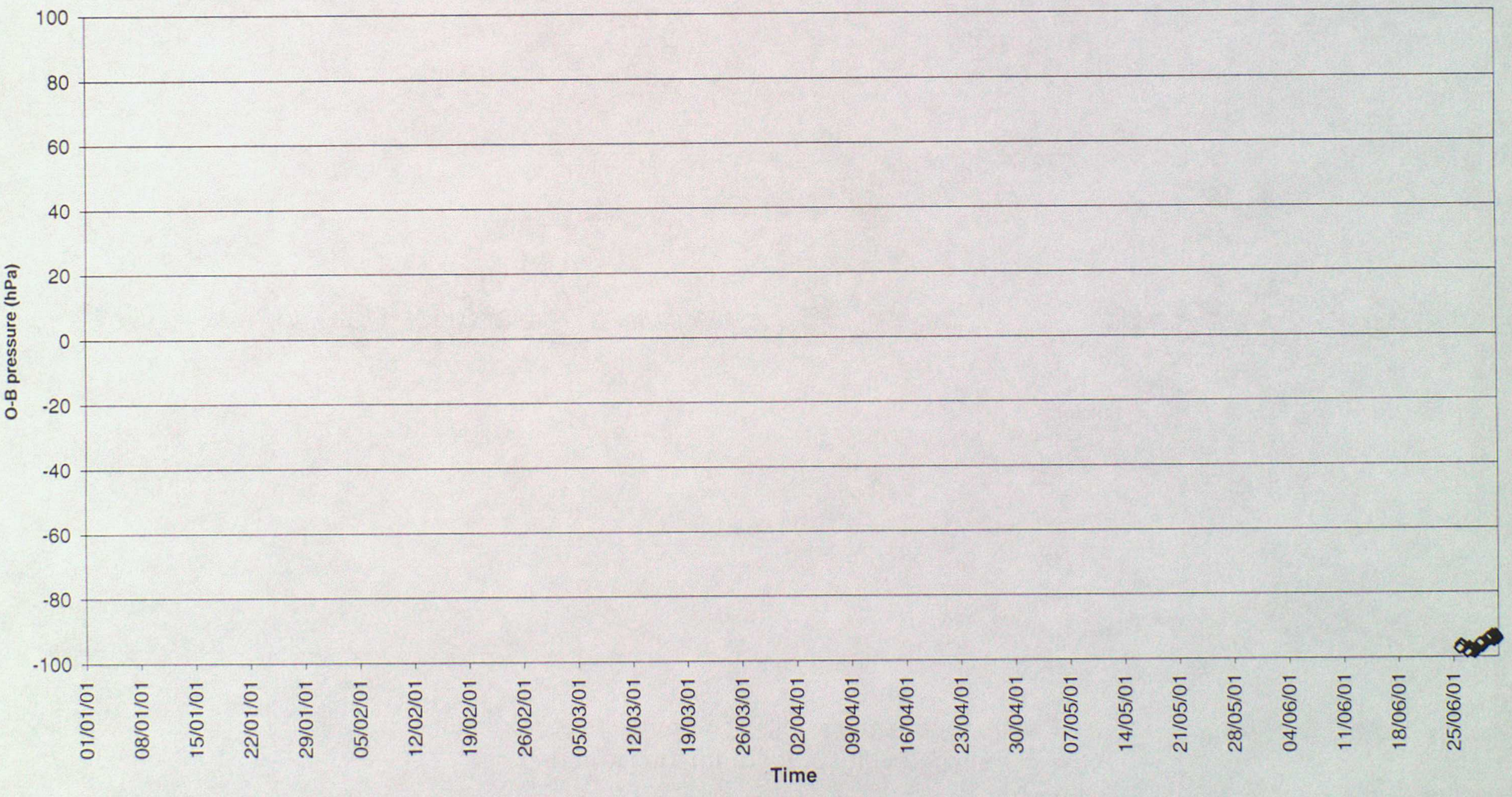
O-B pressure (hPa) for identifier 52643
Number of obs. plotted = 25    Number of outliers = 15



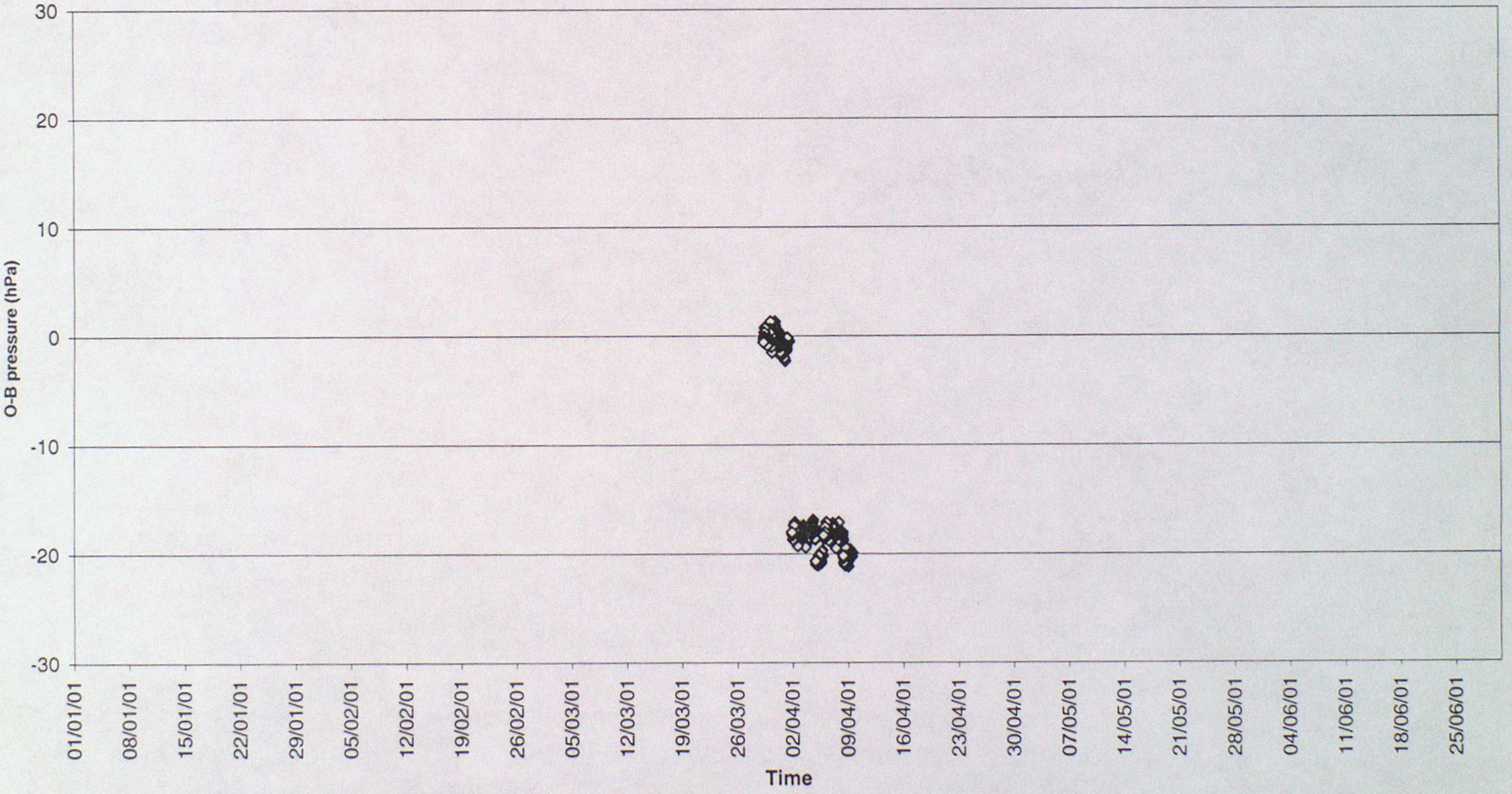
O-B pressure (hPa) for identifier 55904
Number of obs. plotted = 2875    Number of outliers = 31



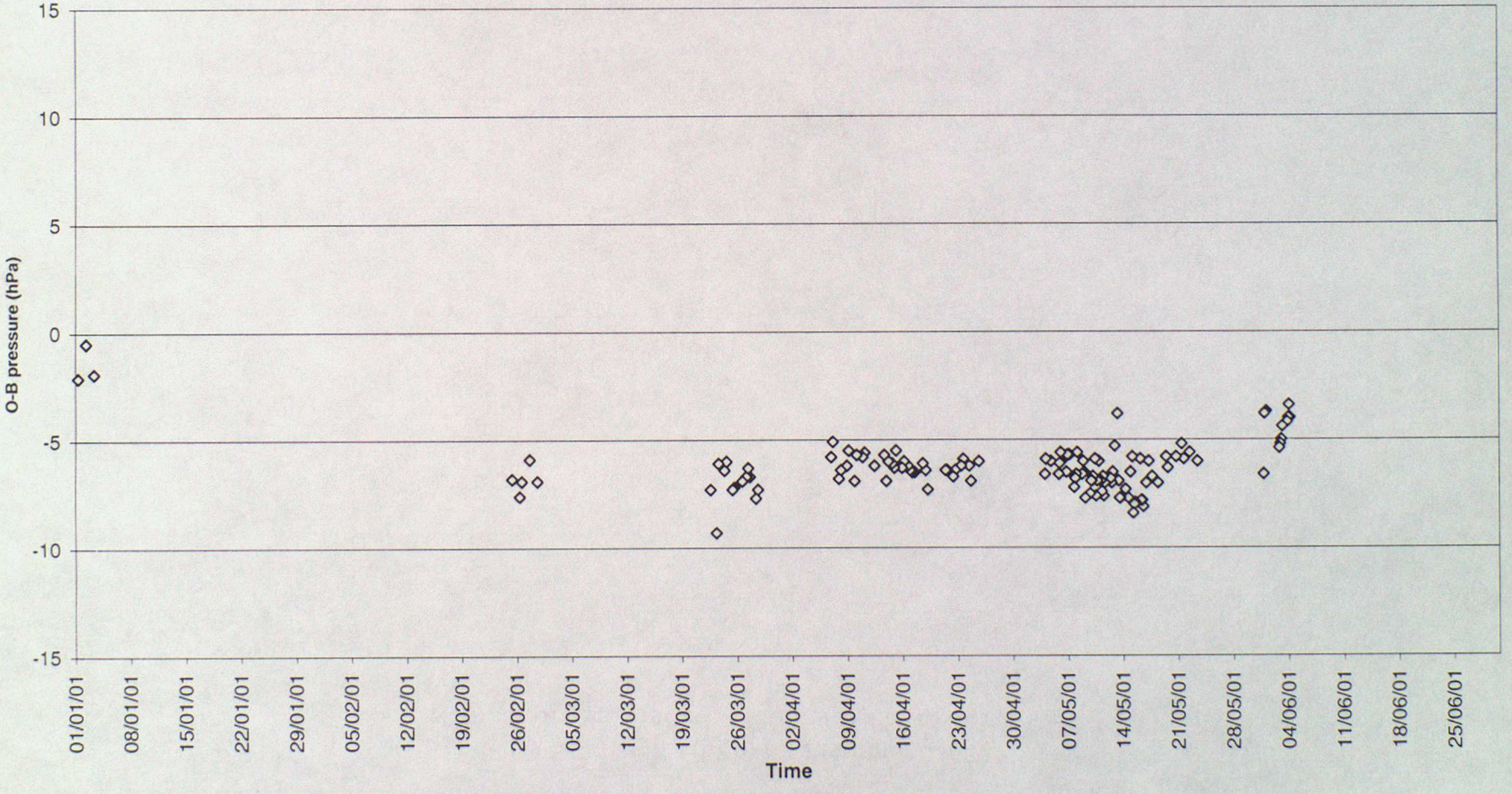
O-B pressure (hPa) for identifier 56808
Number of obs. plotted = 71    Number of outliers = 0

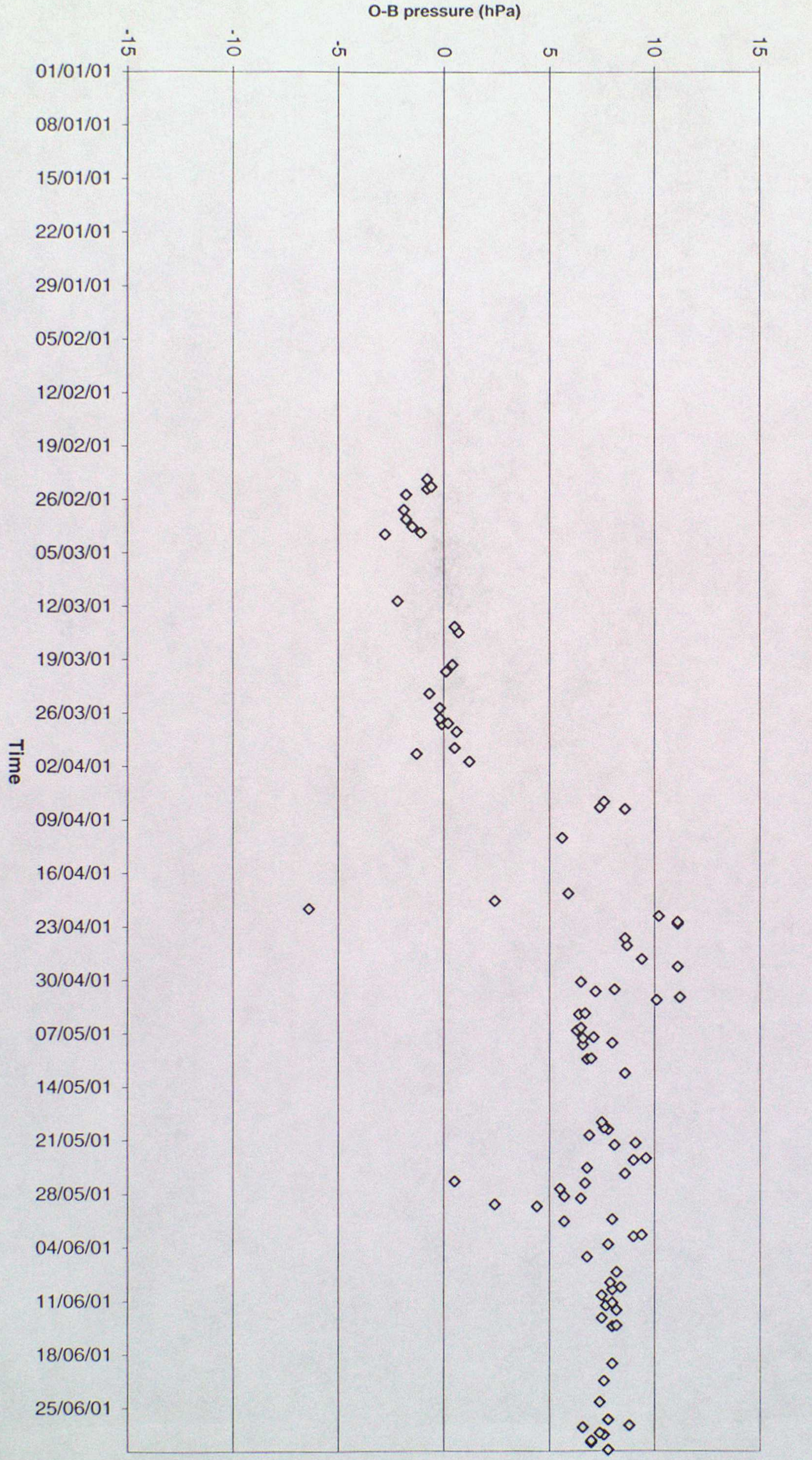


O-B pressure (hPa) for identifier 61538
Number of obs. plotted = 336    Number of outliers = 0



O-B pressure (hPa) for identifier 62137
Number of obs. plotted = 129    Number of outliers = 0

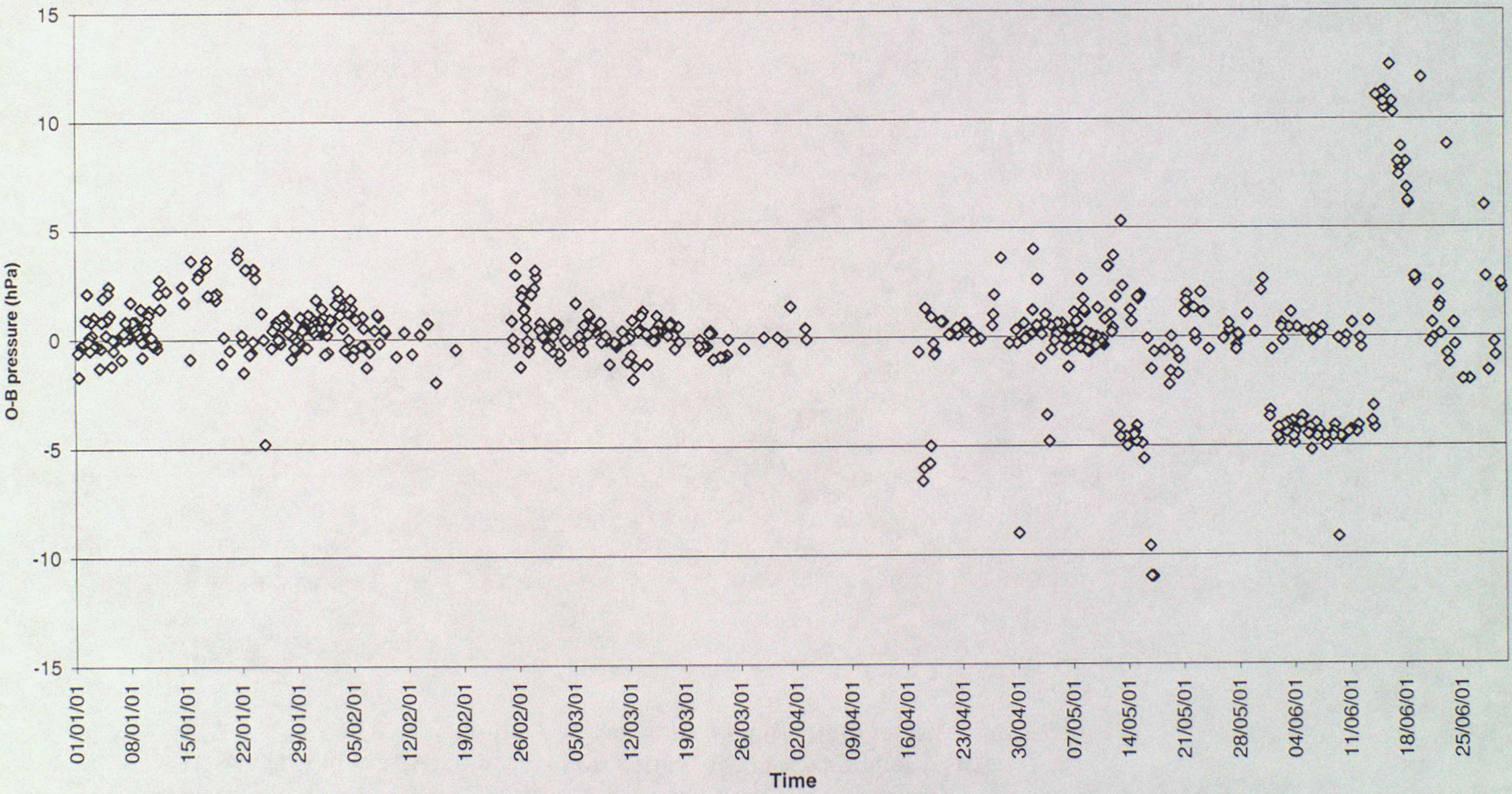


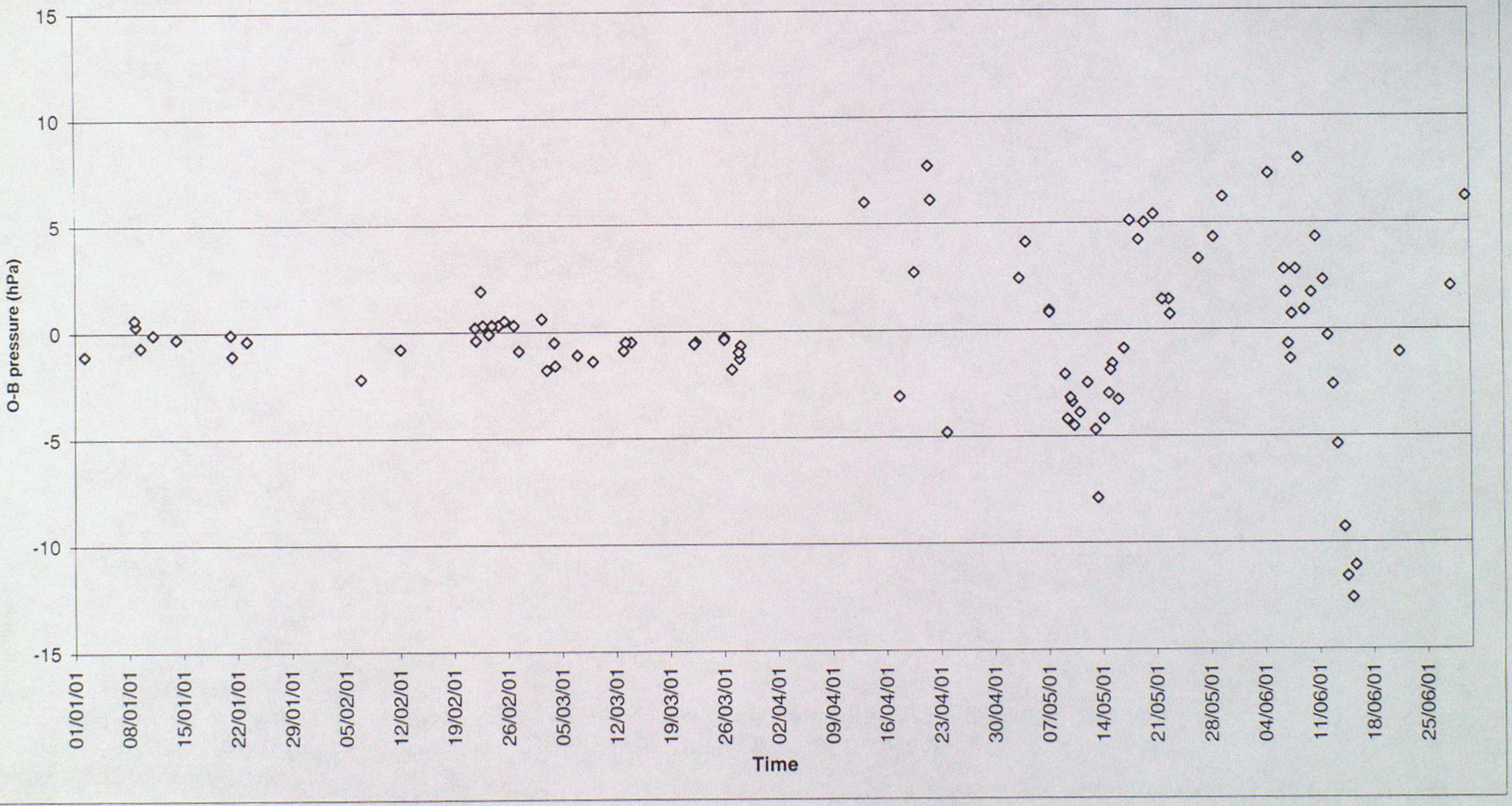


O-B pressure (hPa) for identifier 62151

Number of obs. plotted = 98    Number of outliers = 0

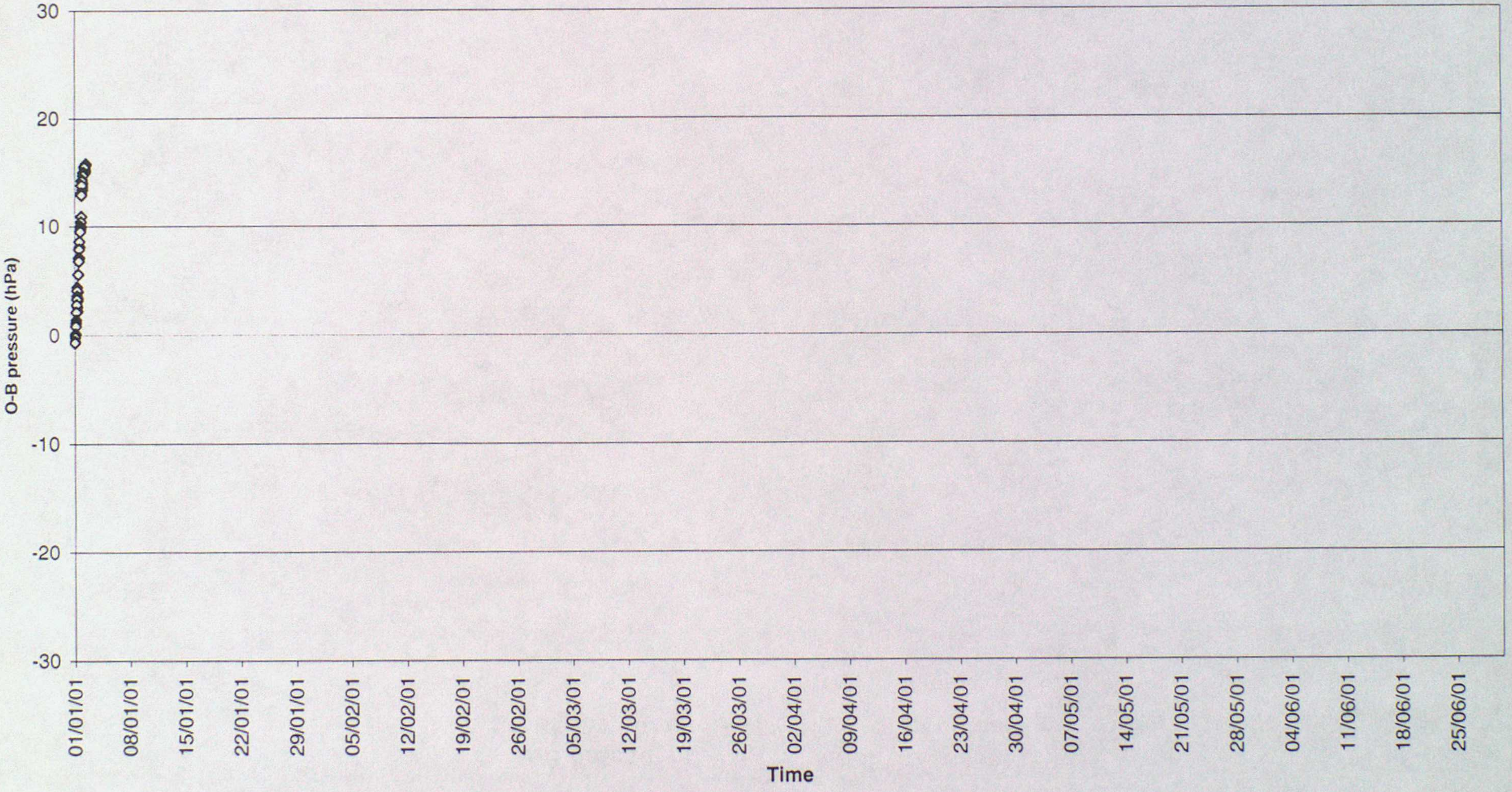
O-B pressure (hPa) for identifier 62155
Number of obs. plotted = 522    Number of outliers = 3



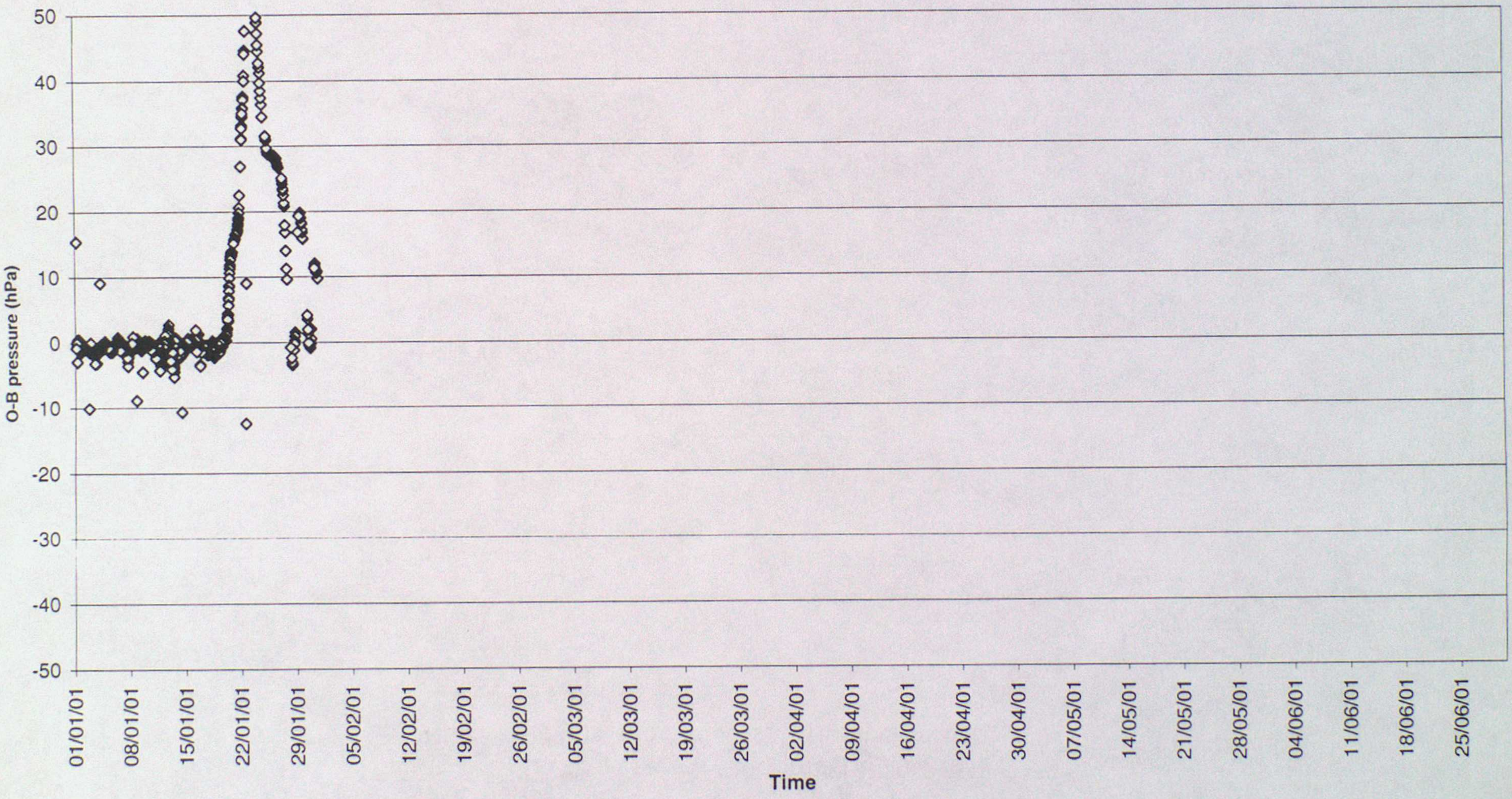


O-B pressure (hPa) for identifier 64049
Number of obs. plotted = 95    Number of outliers = 0

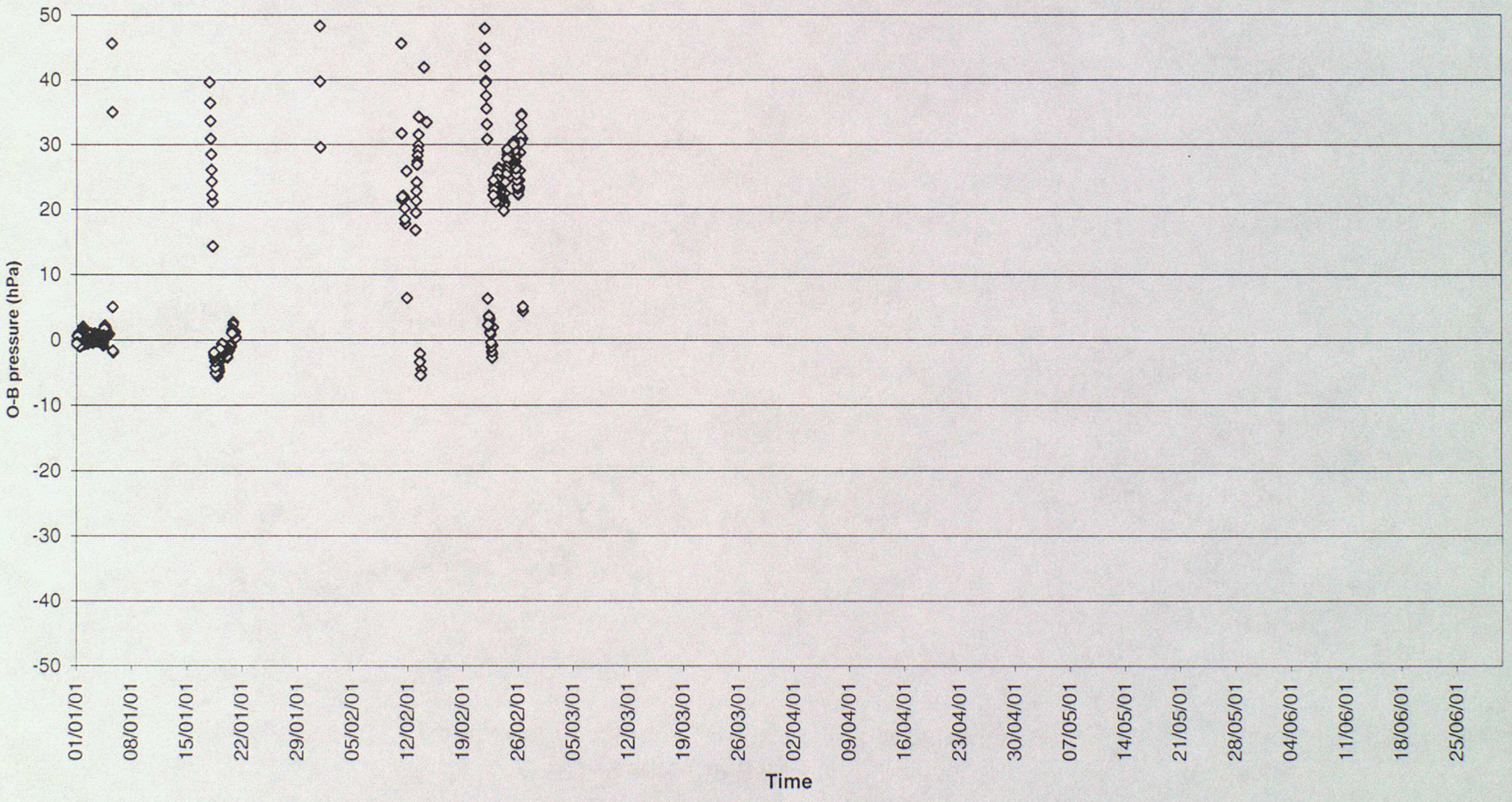
O-B pressure (hPa) for identifier 64699
Number of obs. plotted = 62    Number of outliers = 0

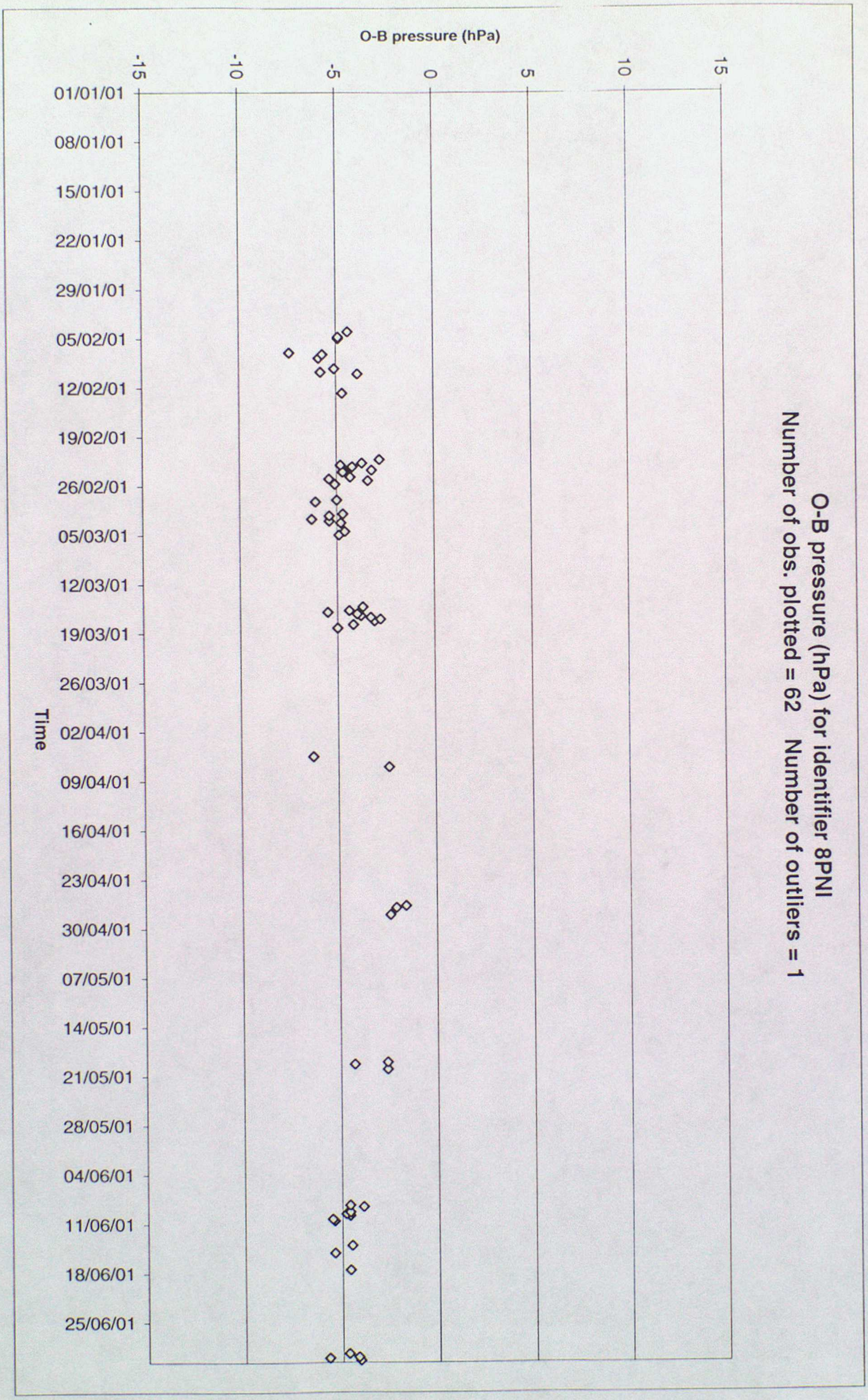


O-B pressure (hPa) for identifier 65601
Number of obs. plotted = 889    Number of outliers = 20

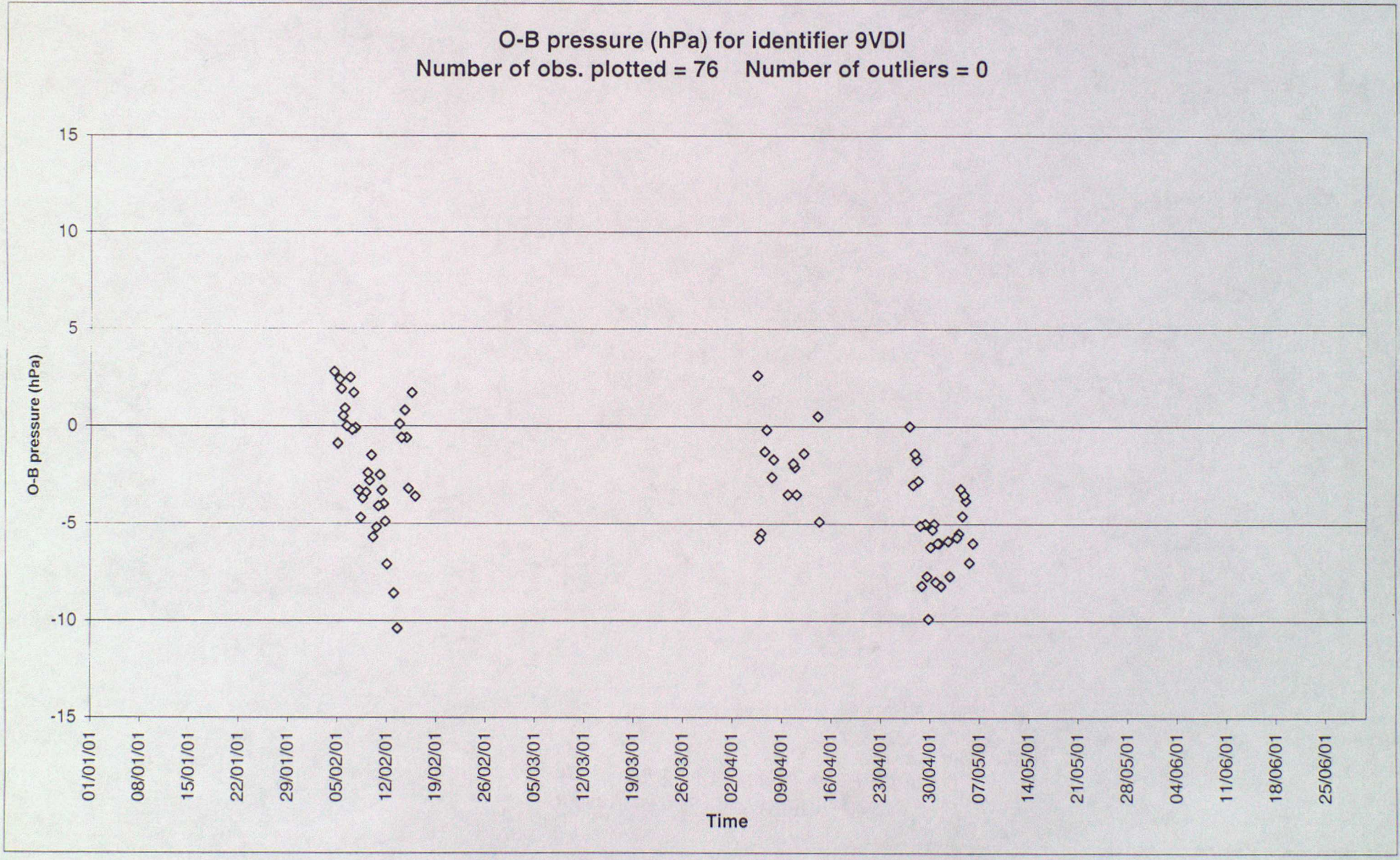


O-B pressure (hPa) for identifier 71512
Number of obs. plotted = 403    Number of outliers = 37



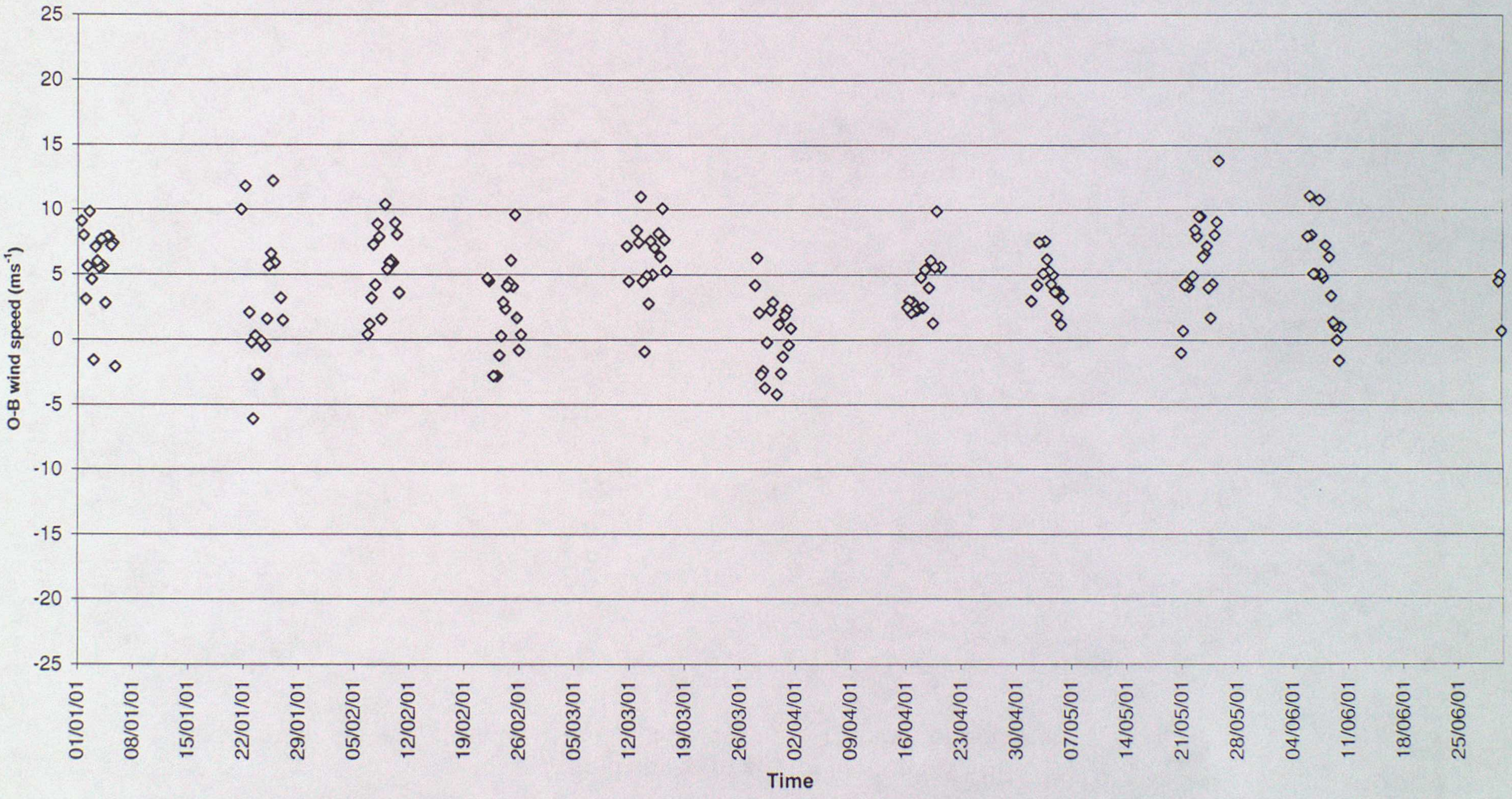


O-B pressure (hPa) for identifier 8PNI
Number of obs. plotted = 62    Number of outliers = 1

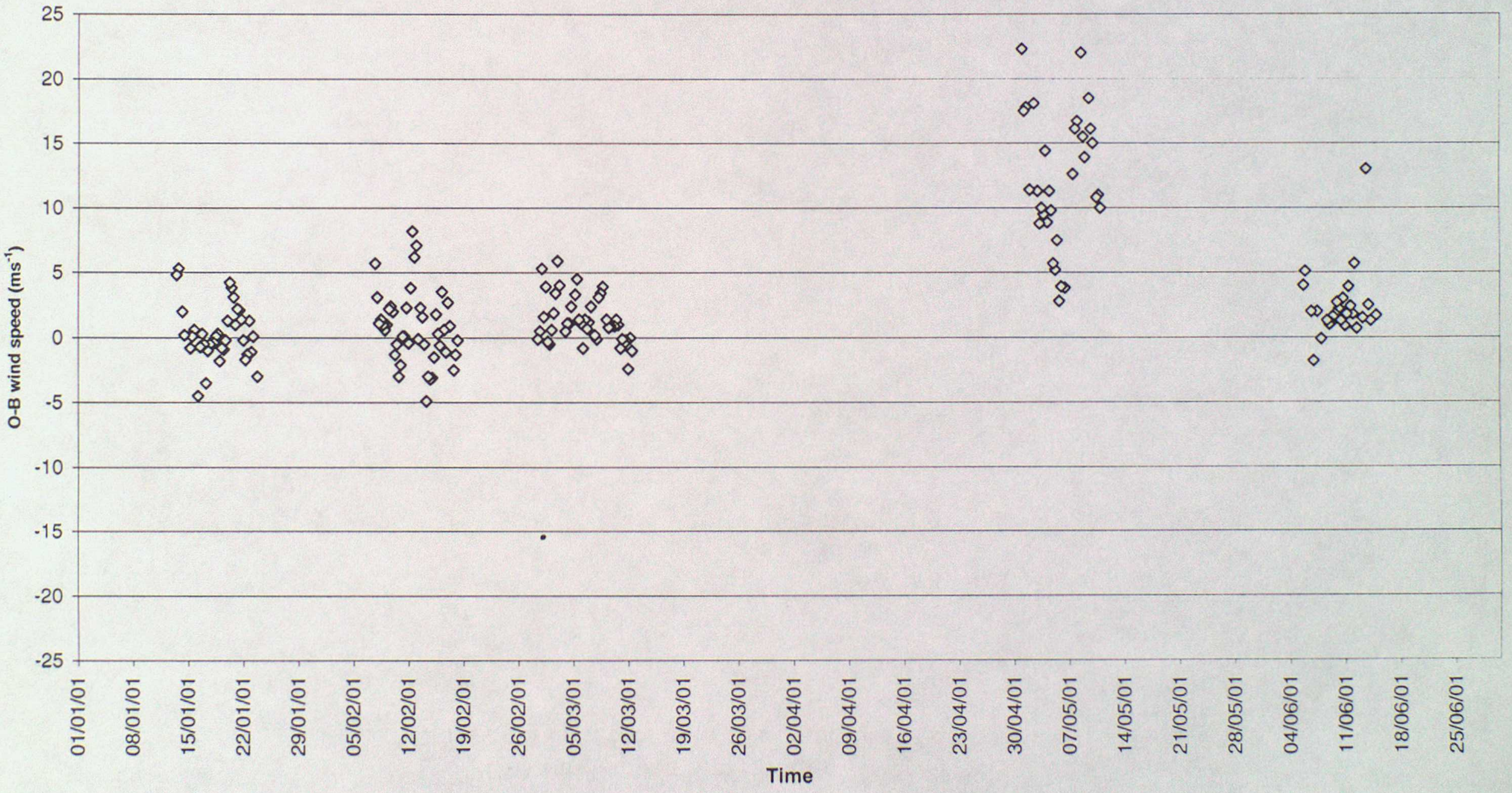


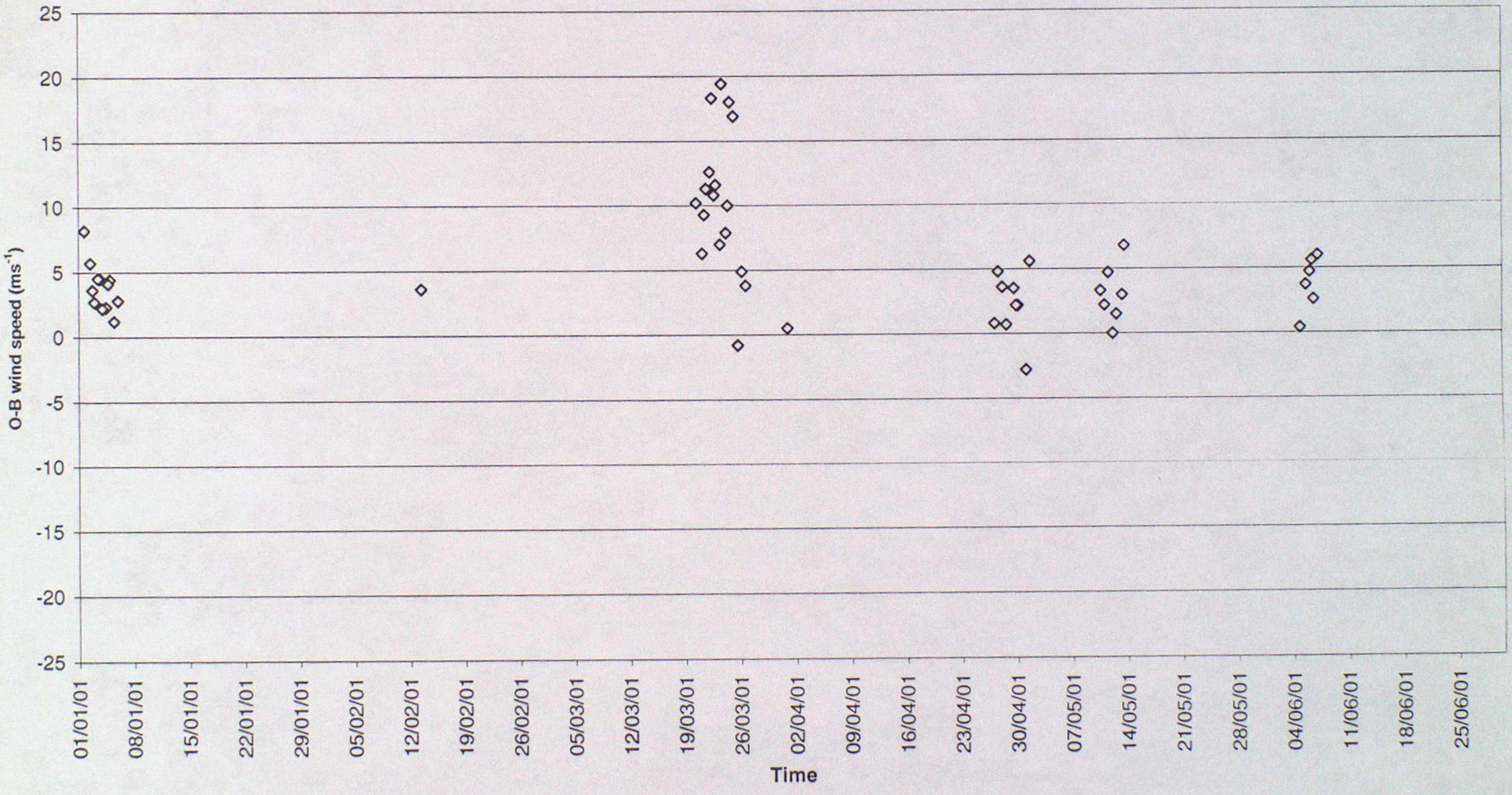
O-B pressure (hPa) for identifier 9VDI
Number of obs. plotted = 76    Number of outliers = 0

O-B wind speed (ms$^{-1}$) for identifier C6NI3
Number of obs. plotted = 168    Number of outliers = 0

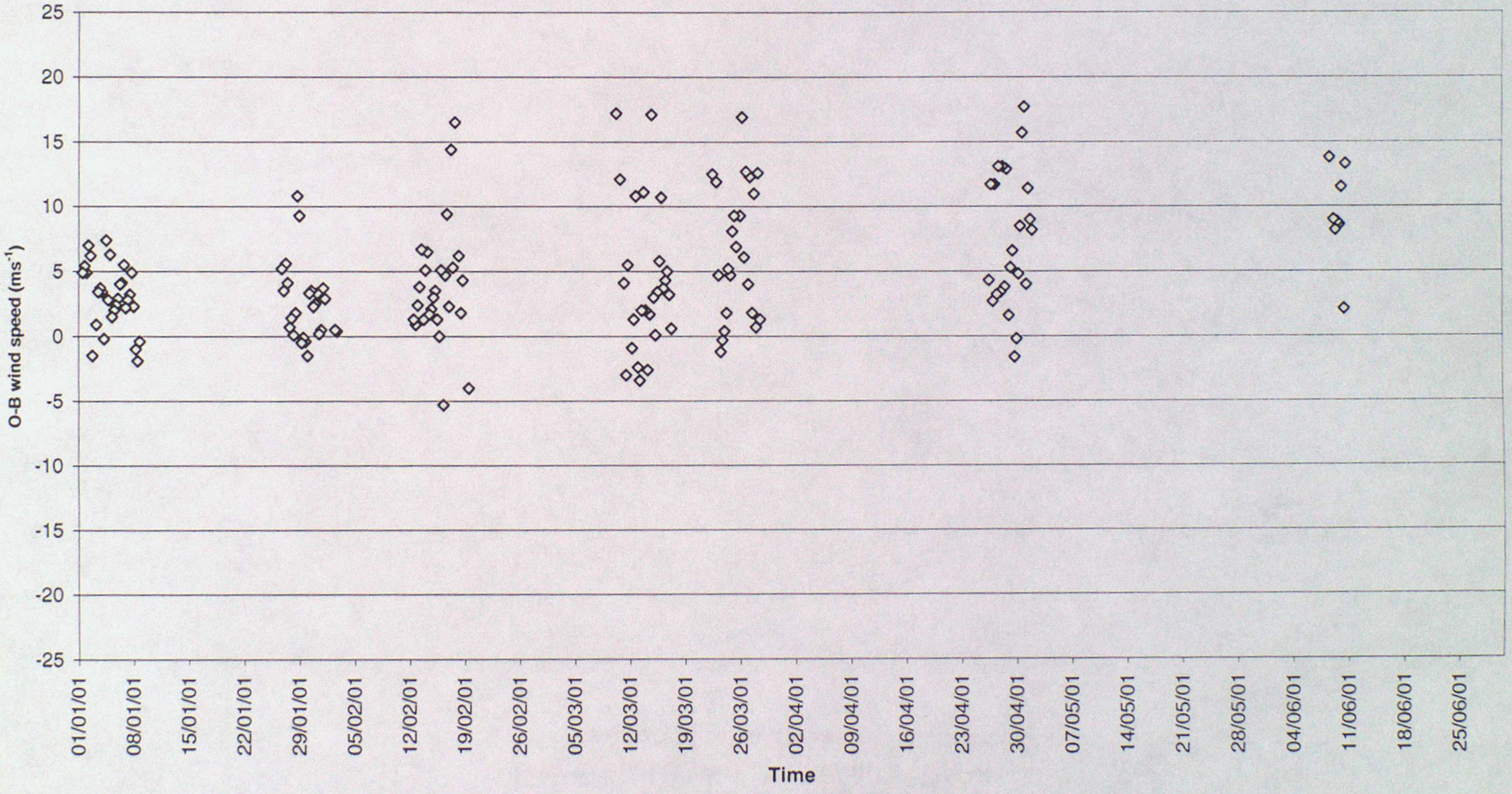


O-B wind speed ($ms^{-1}$) for identifier C6NR5
Number of obs. plotted = 179    Number of outliers = 1

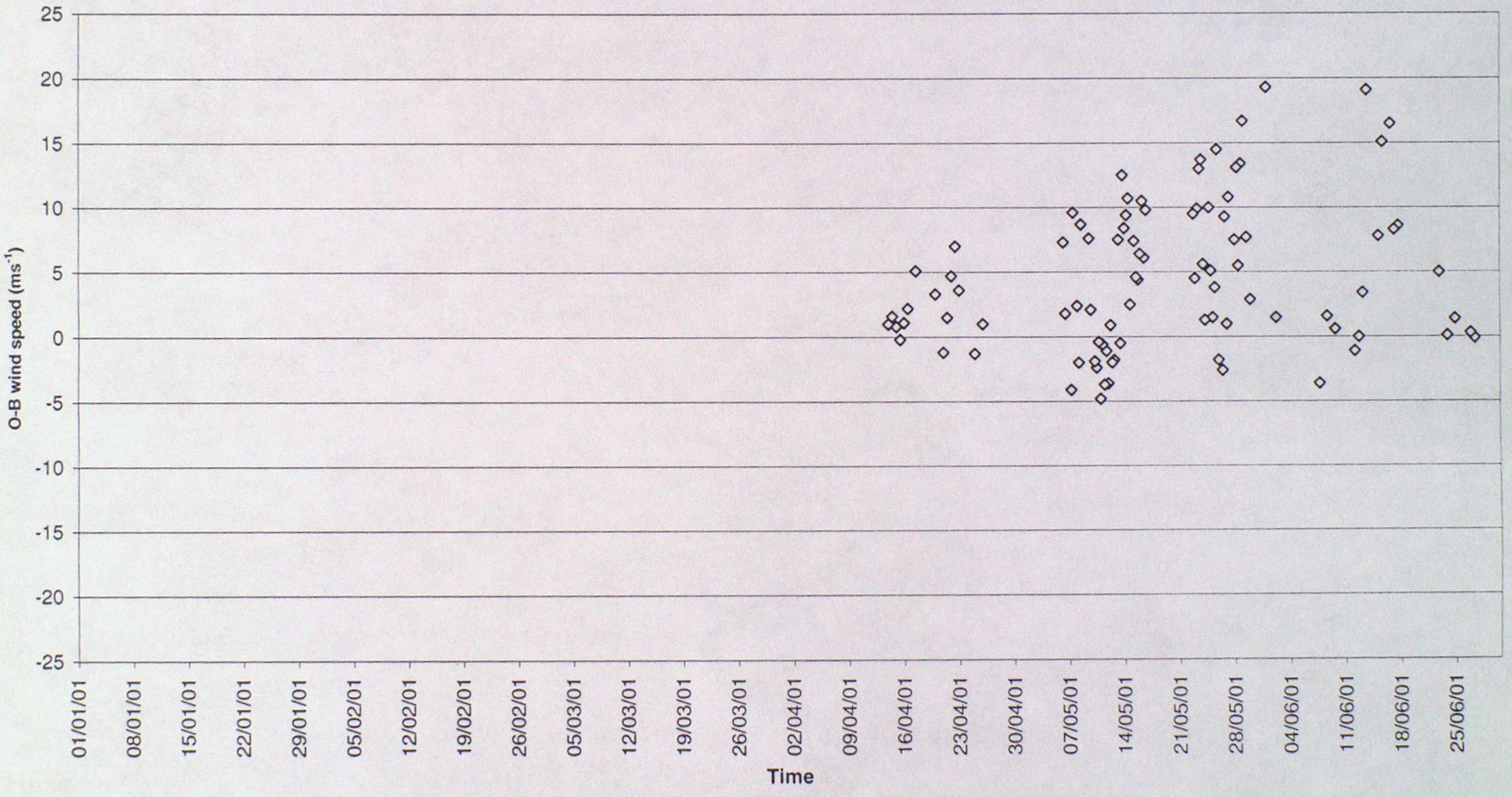




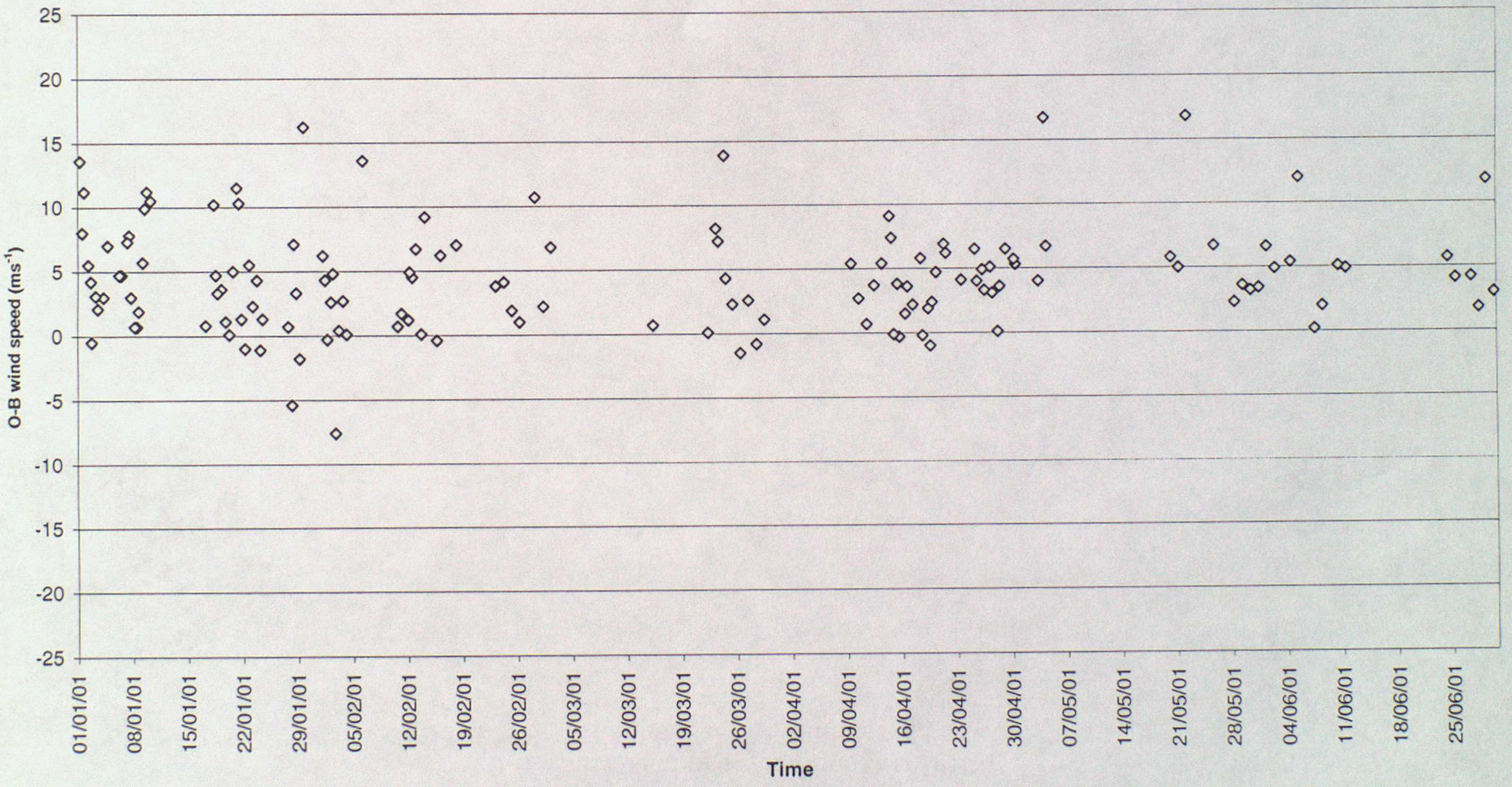
O-B wind speed ($ms^{-1}$) for identifier DAPP
Number of obs. plotted = 54    Number of outliers = 1


O-B wind speed ($ms^{-1}$) for identifier DFRZ
Number of obs. plotted = 160    Number of outliers = 1

O-B wind speed ($ms^{-1}$) for identifier DHDH
Number of obs. plotted = 92    Number of outliers = 0

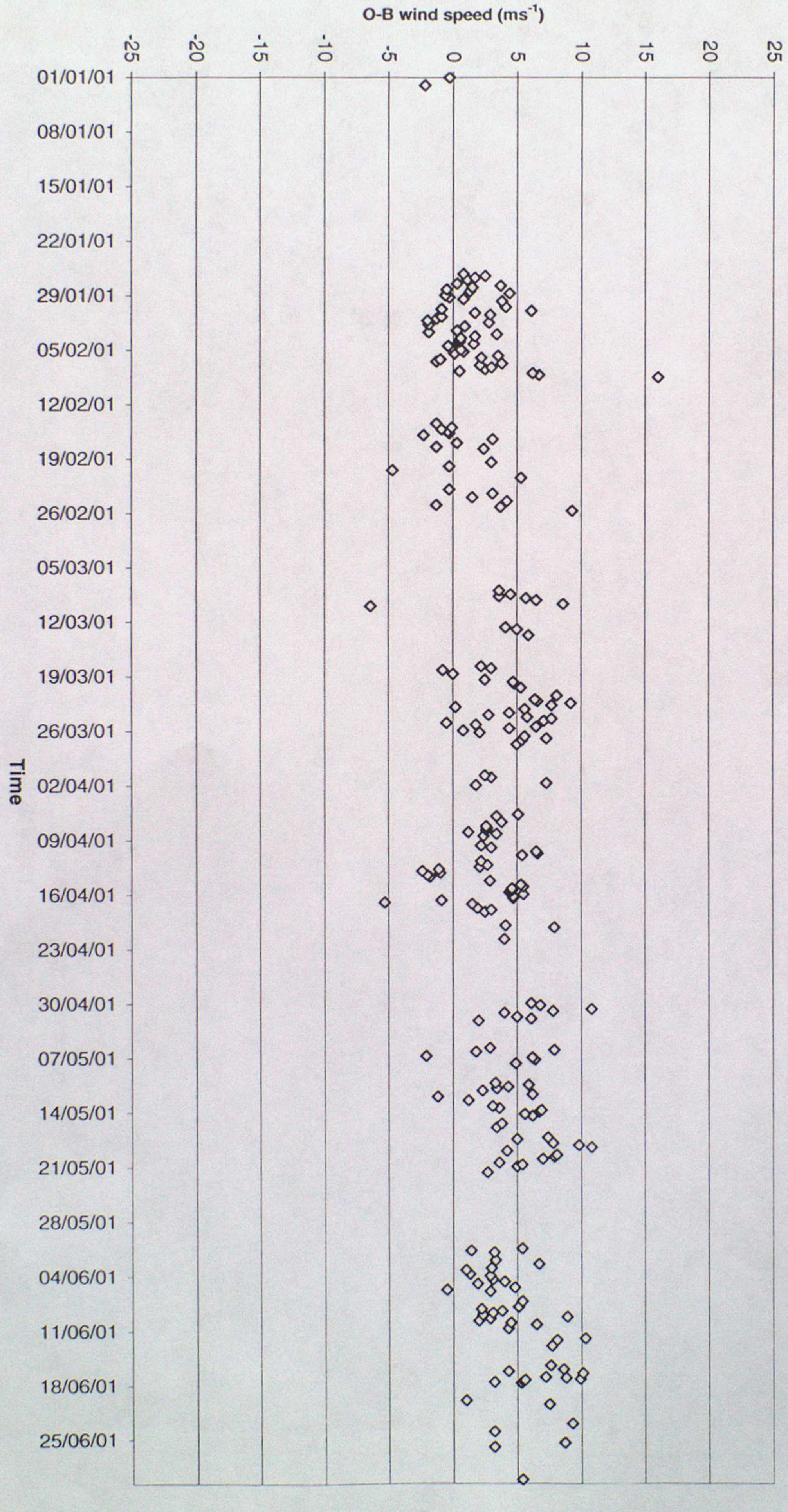


O-B wind speed ($ms^{-1}$) for identifier DPBP
Number of obs. plotted = 142    Number of outliers = 0

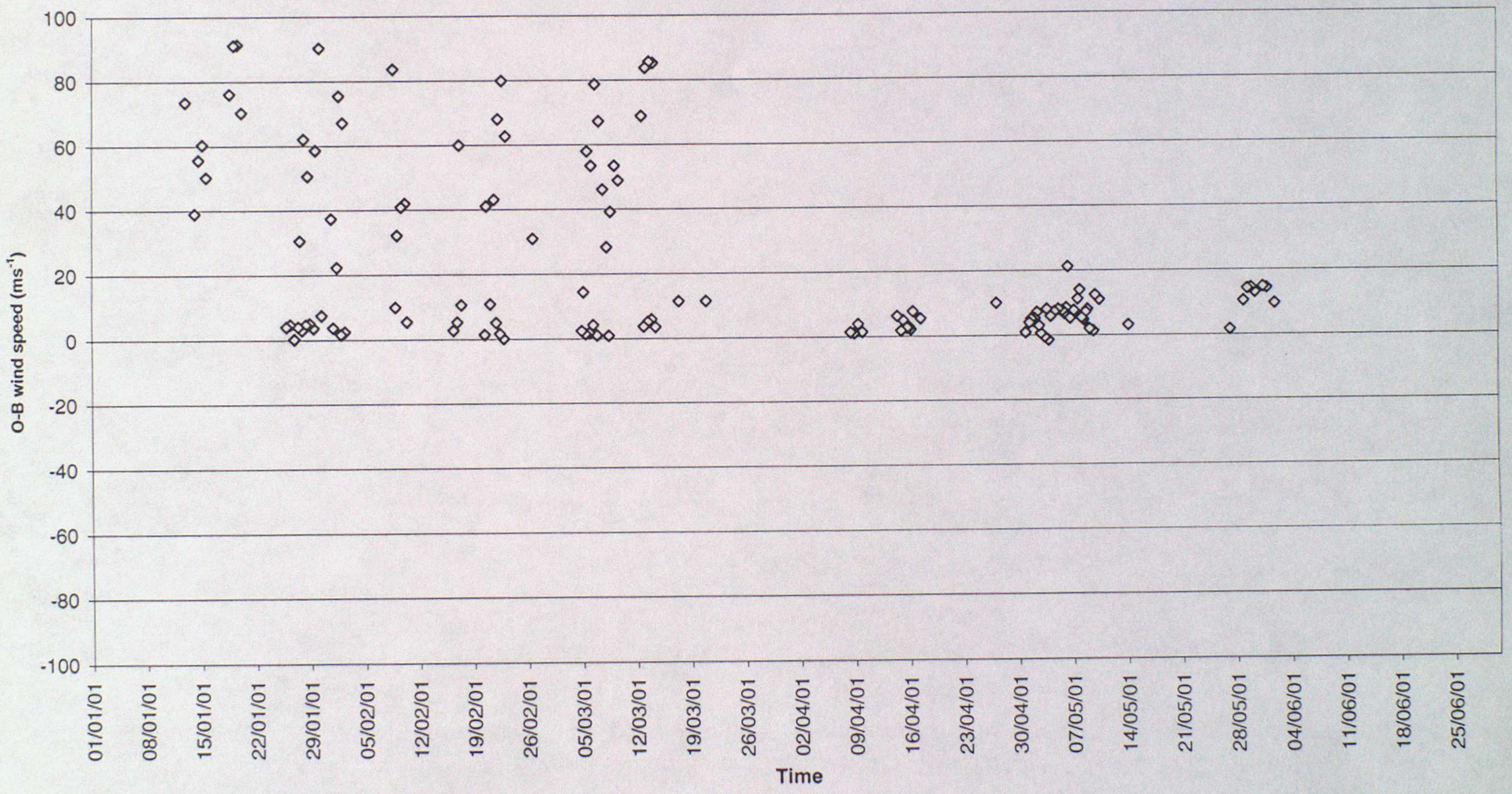


O-B wind speed (ms$^{-1}$) for identifier ELUT5

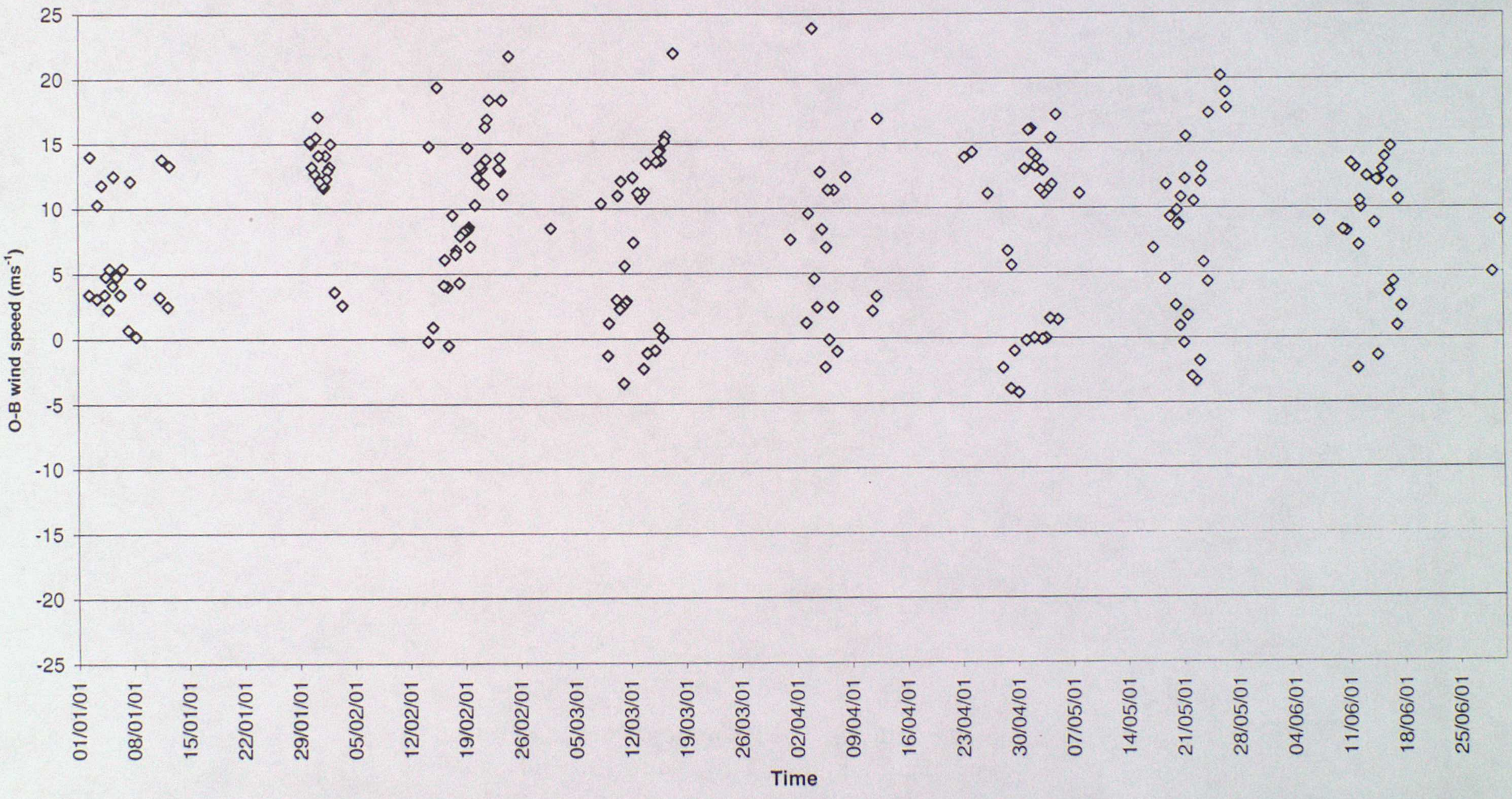
Number of obs. plotted = 249   Number of outliers = 1

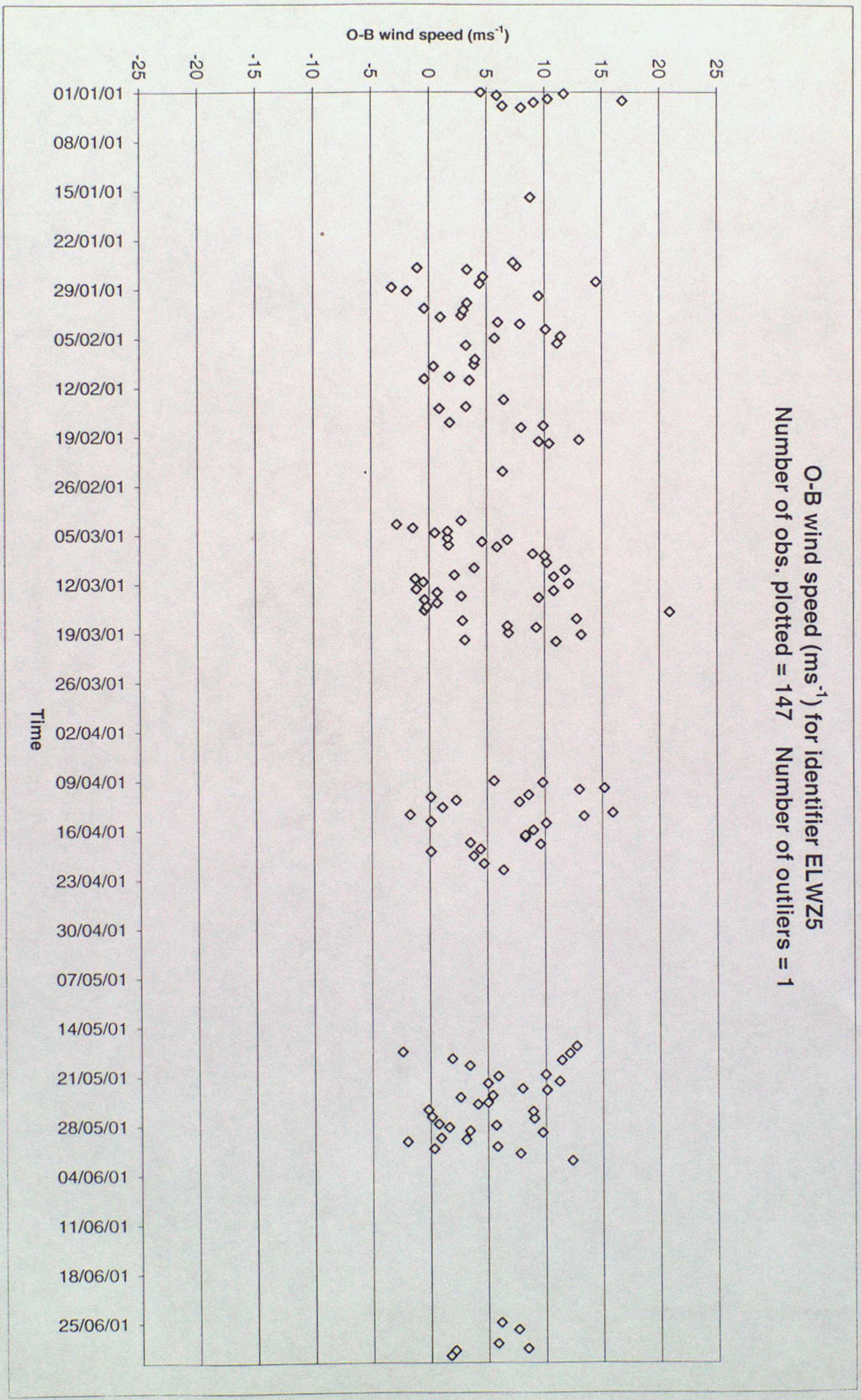


O-B wind speed (ms-1) for identifier ELVG2
Number of obs. plotted = 129    Number of outliers = 0



O-B wind speed ($ms^{-1}$) for identifier ELWP8
Number of obs. plotted = 204    Number of outliers = 1



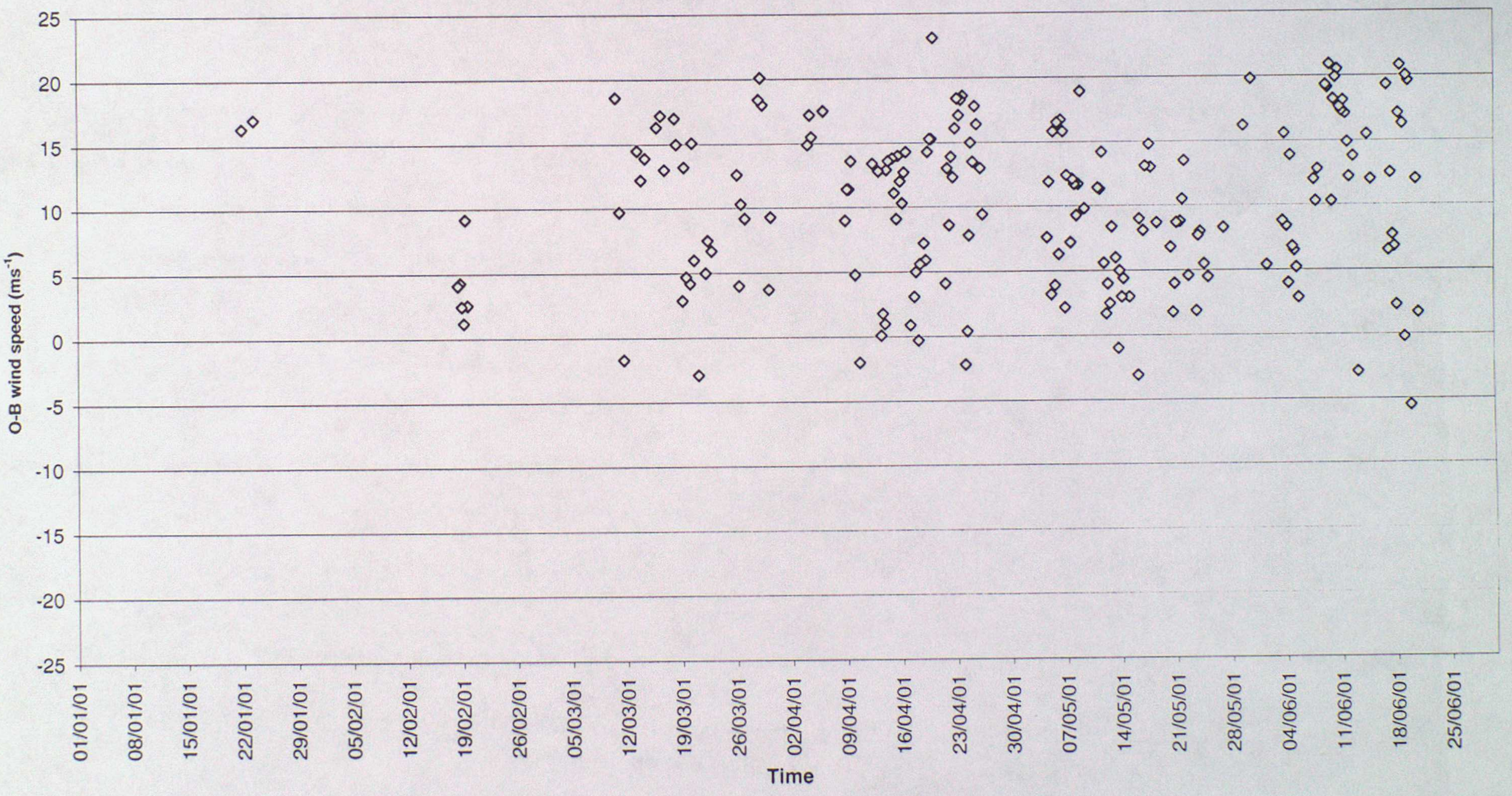


O-B wind speed (ms$^{-1}$) for identifier ELWZ5

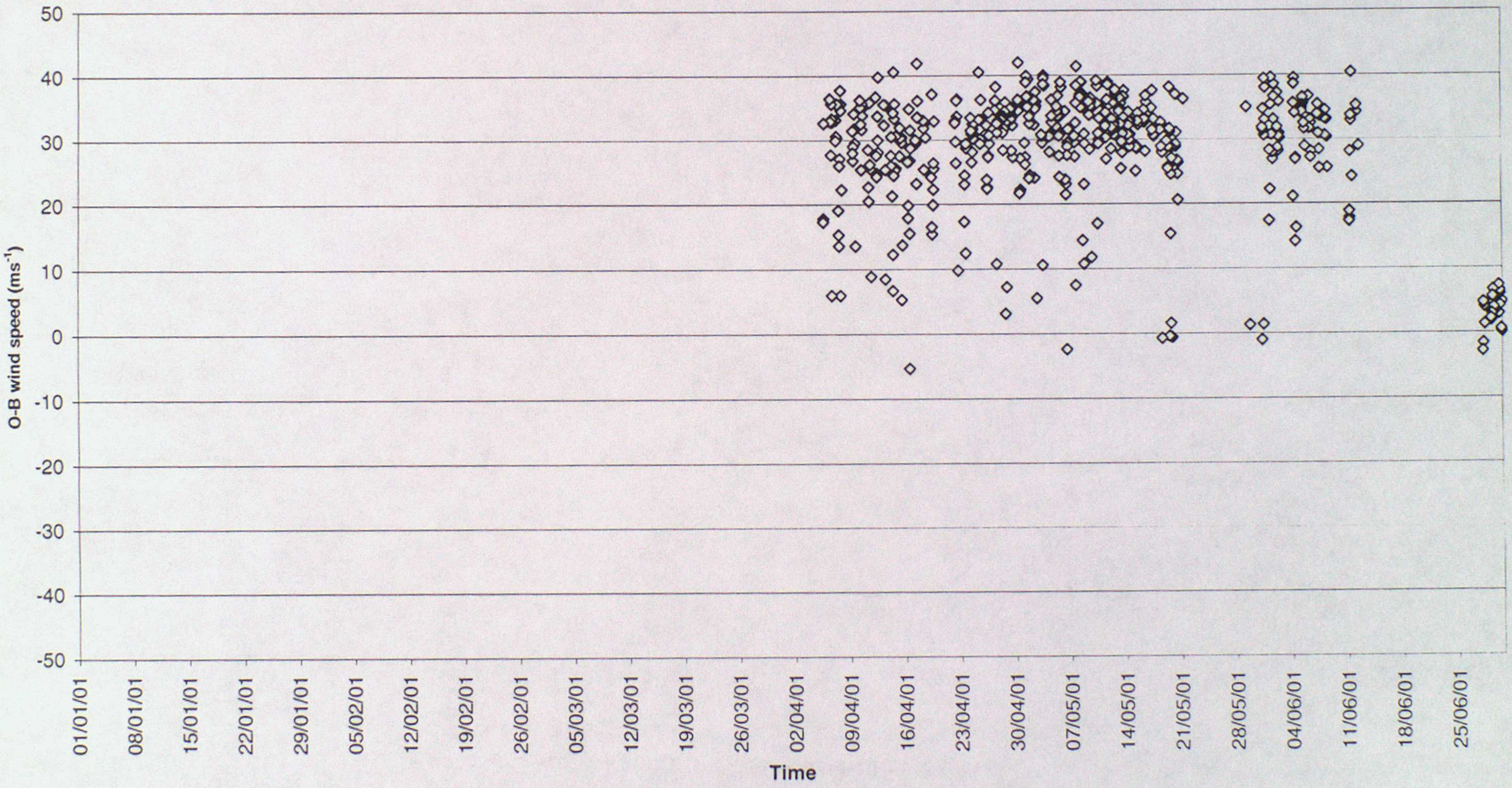
Number of obs. plotted = 147    Number of outliers = 1

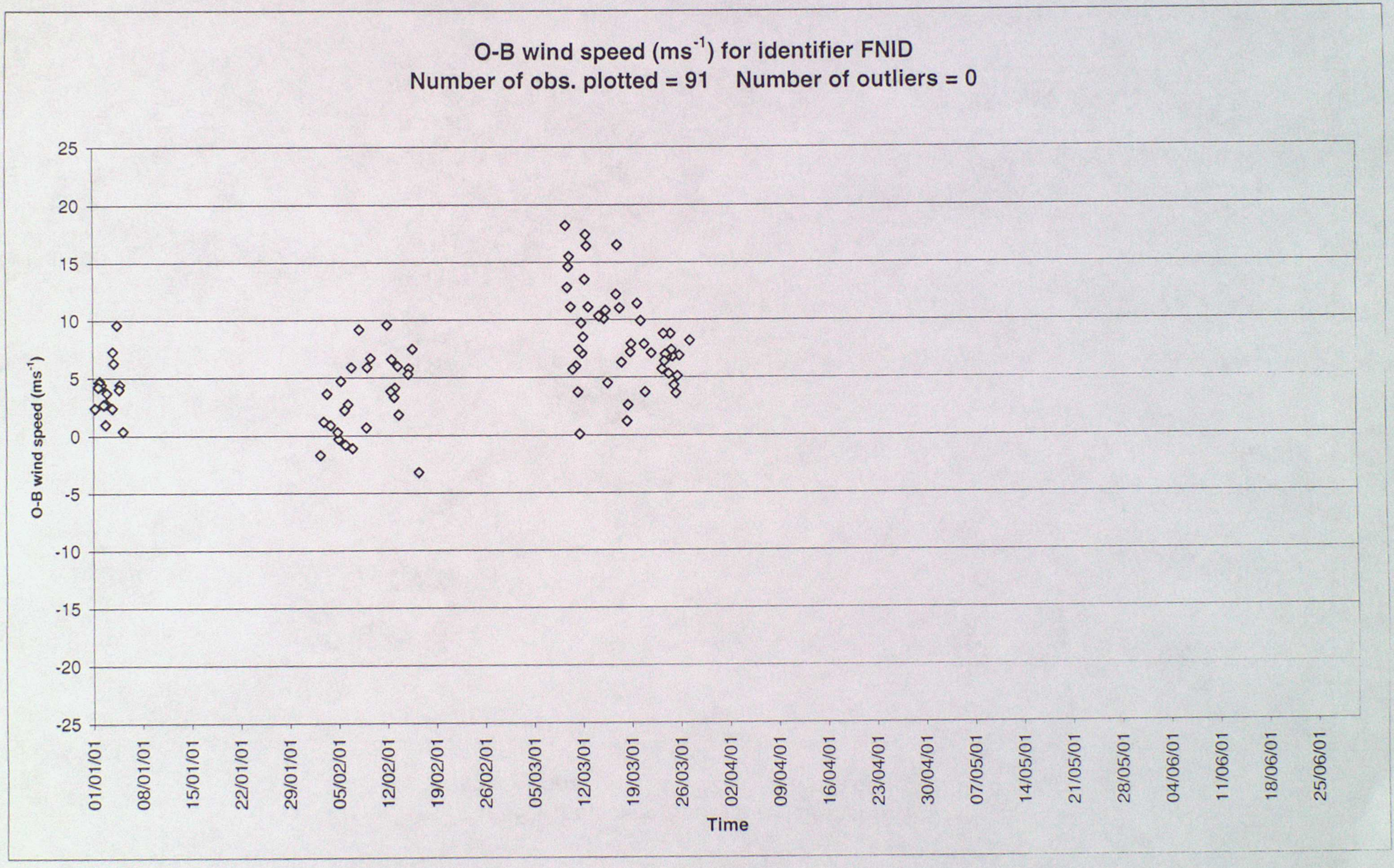
O-B wind speed (ms$^{-1}$) for identifier ELXT8

Number of obs. plotted = 193    Number of outliers = 2



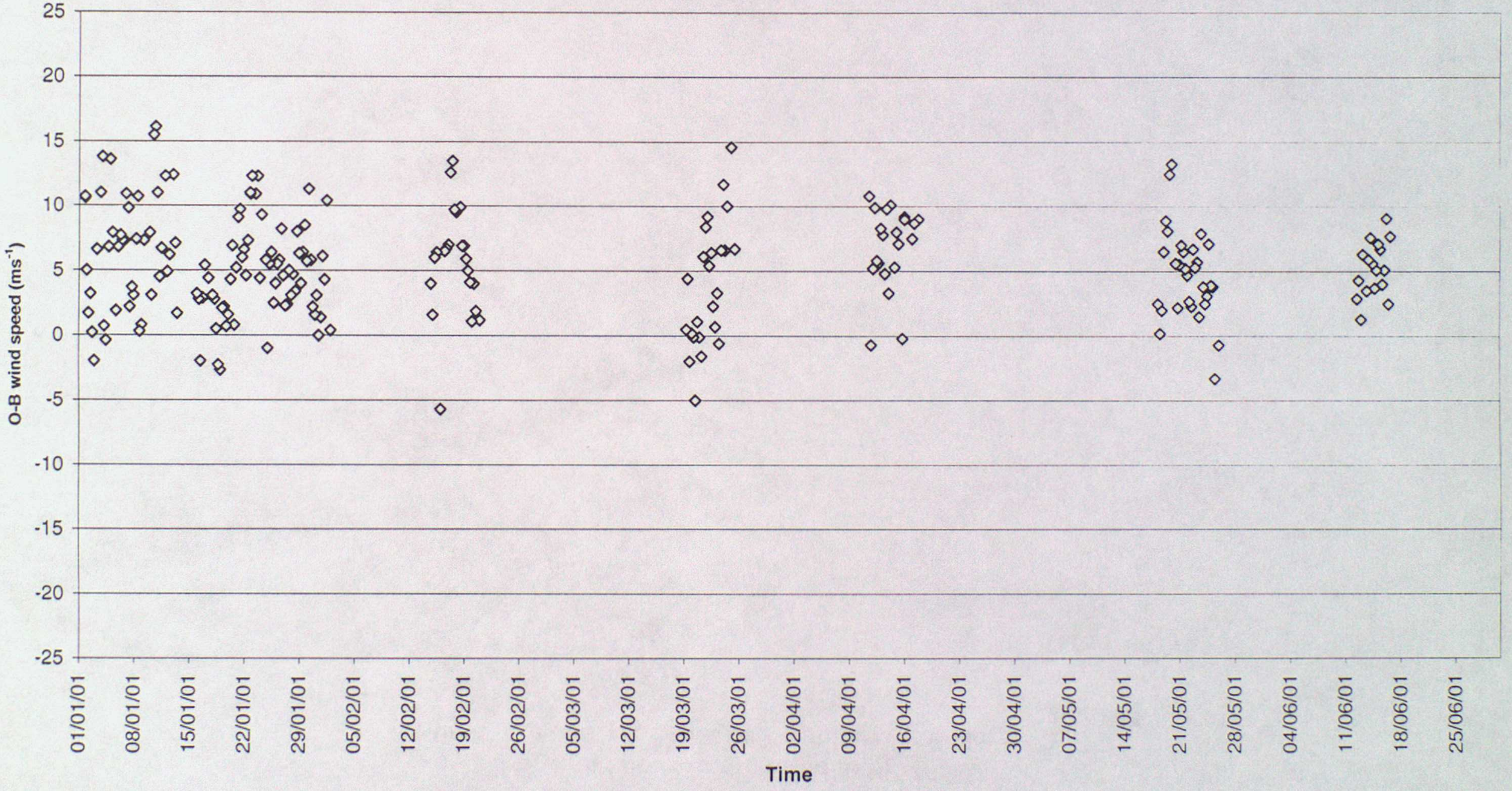
O-B wind speed ($ms^{-1}$) for identifier FKWK
Number of obs. plotted = 492    Number of outliers = 0

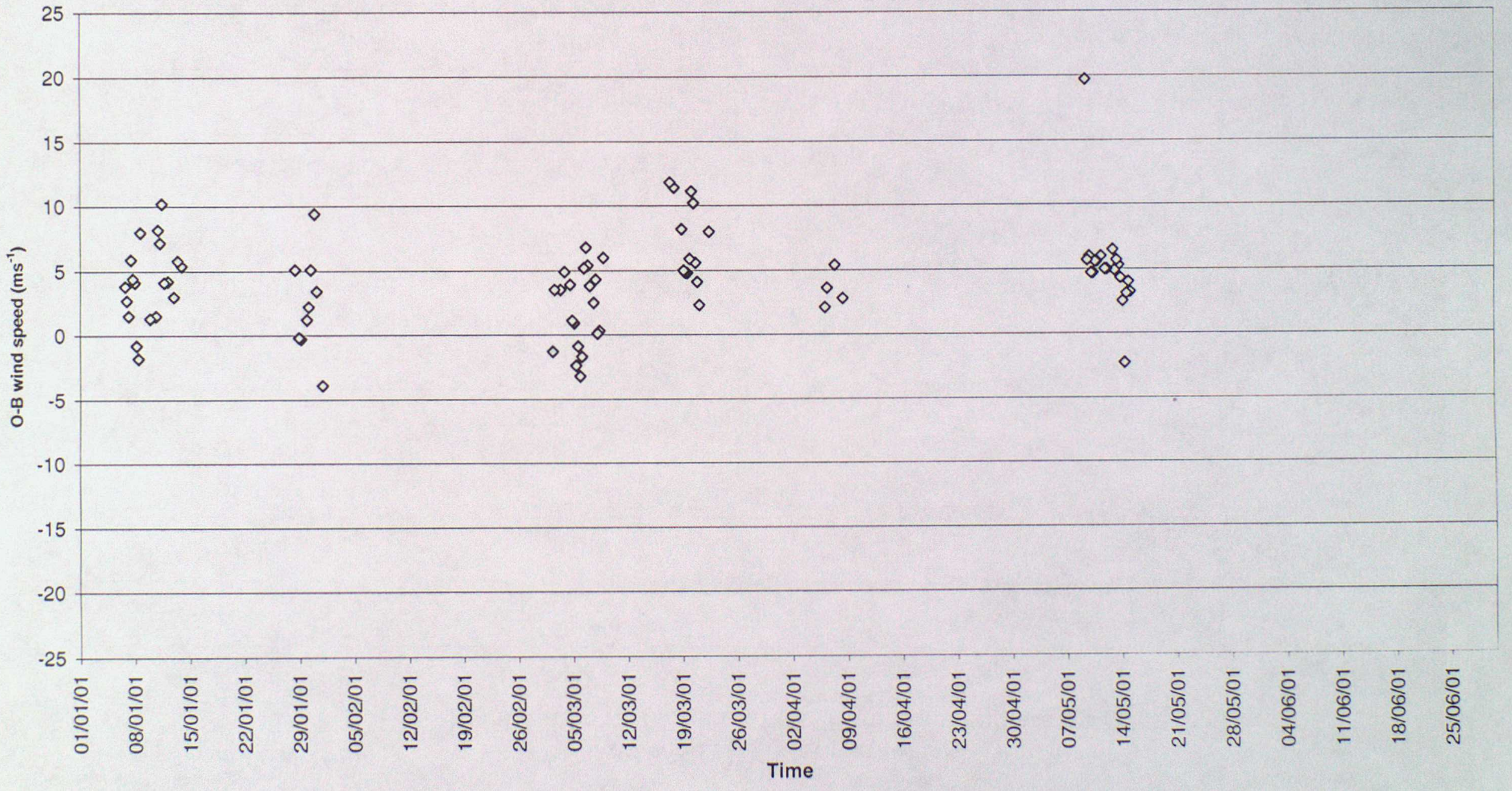




O-B wind speed (ms$^{-1}$) for identifier FNID
Number of obs. plotted = 91    Number of outliers = 0

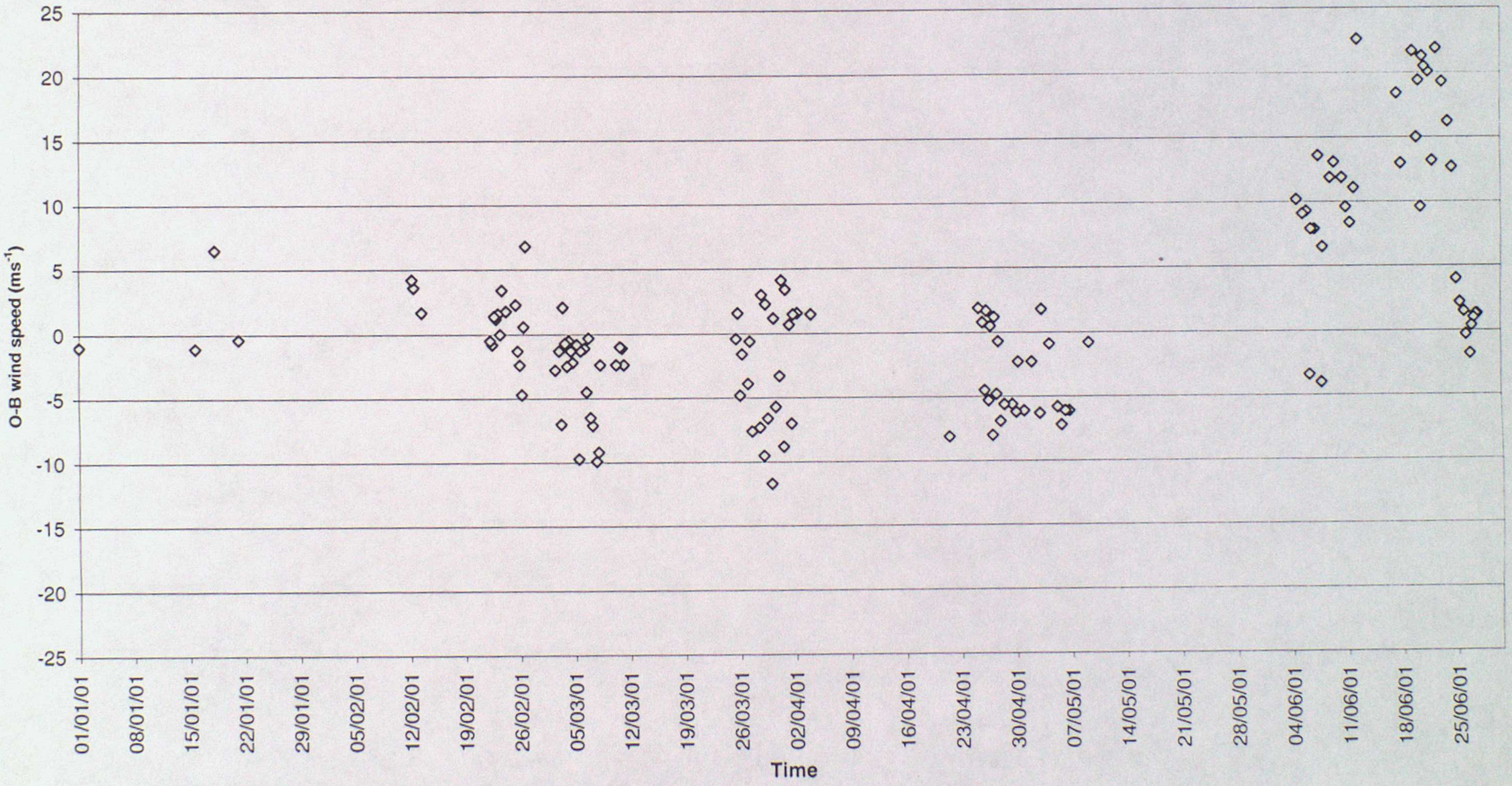
O-B wind speed ($ms^{-1}$) for identifier JKPS
Number of obs. plotted = 222    Number of outliers = 0

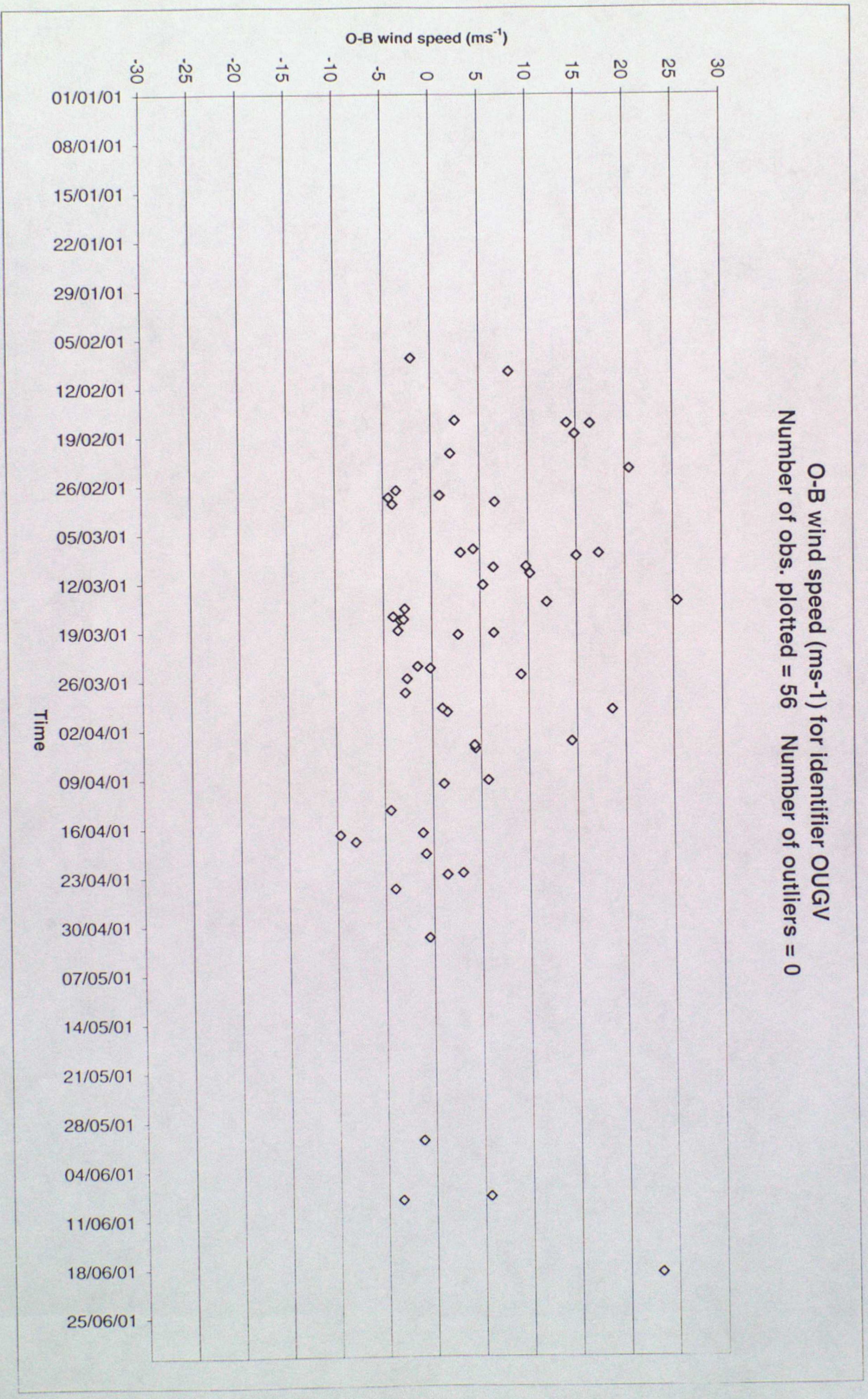




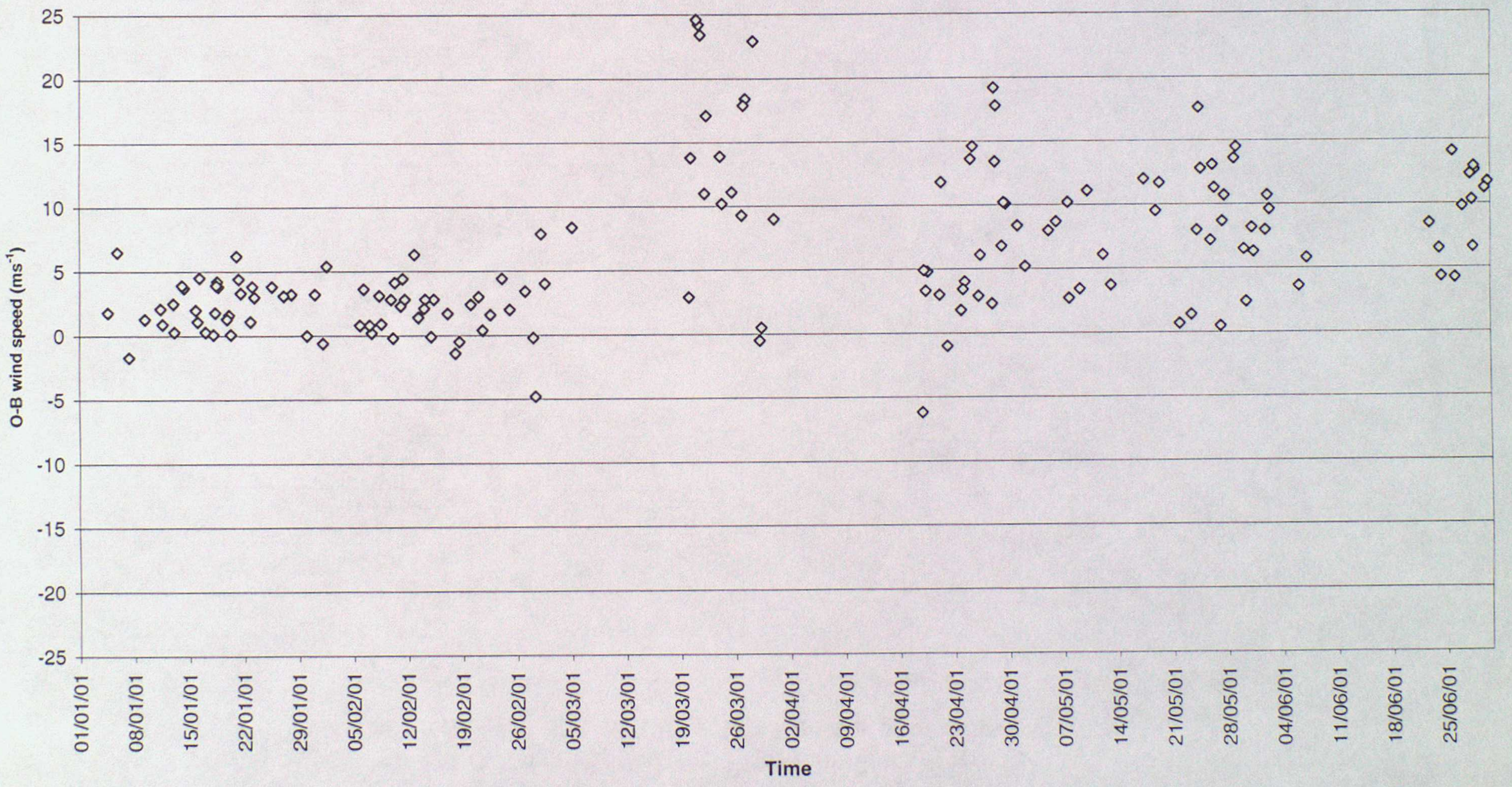
O-B wind speed ($ms^{-1}$) for identifier LAHG2
Number of obs. plotted = 85    Number of outliers = 0

O-B wind speed ($ms^{-1}$) for identifier MXAR9
Number of obs. plotted = 134    Number of outliers = 2



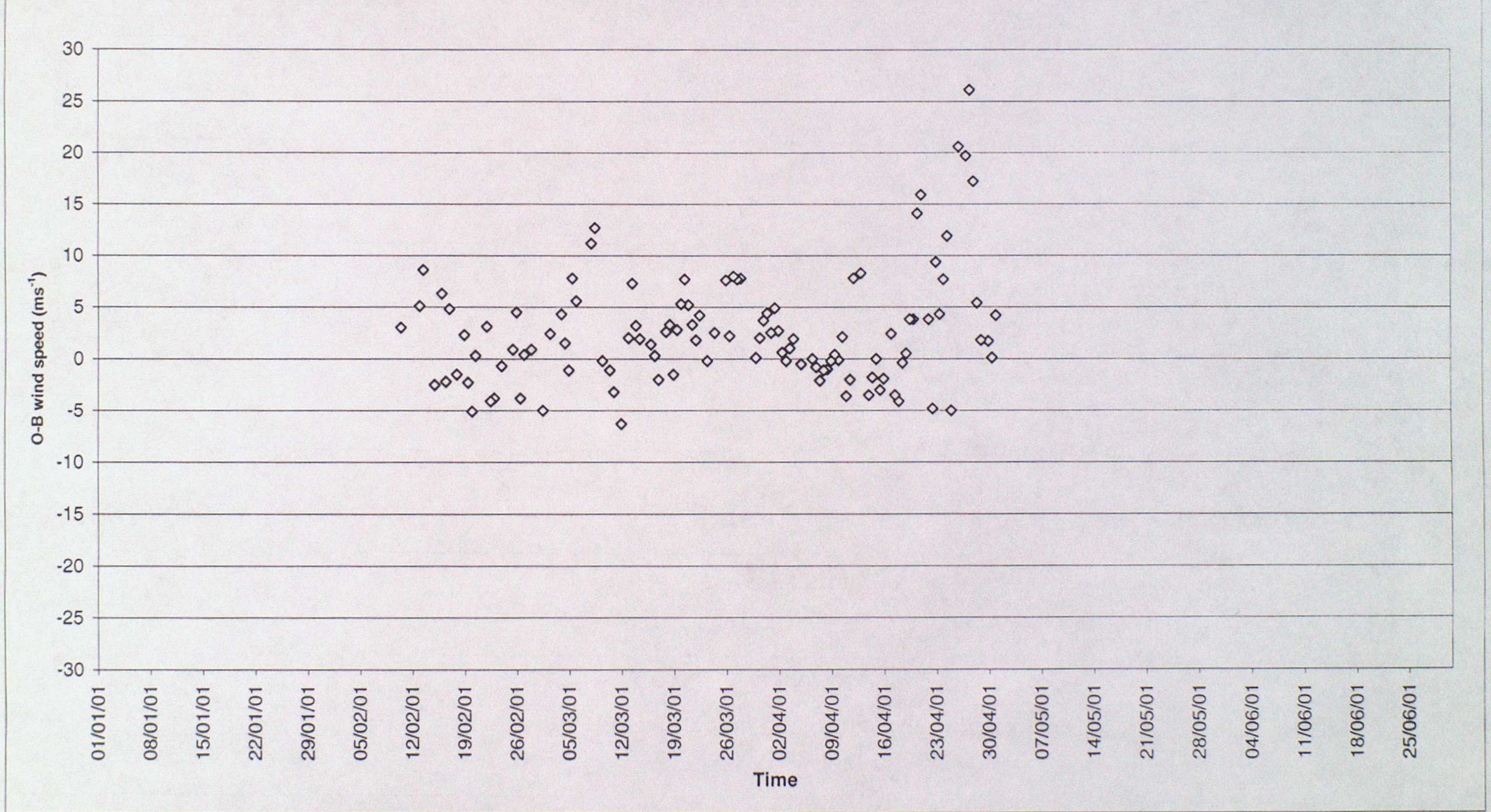


O-B wind speed (ms-1) for identifier OUGV
Number of obs. plotted = 56 Number of outliers = 0

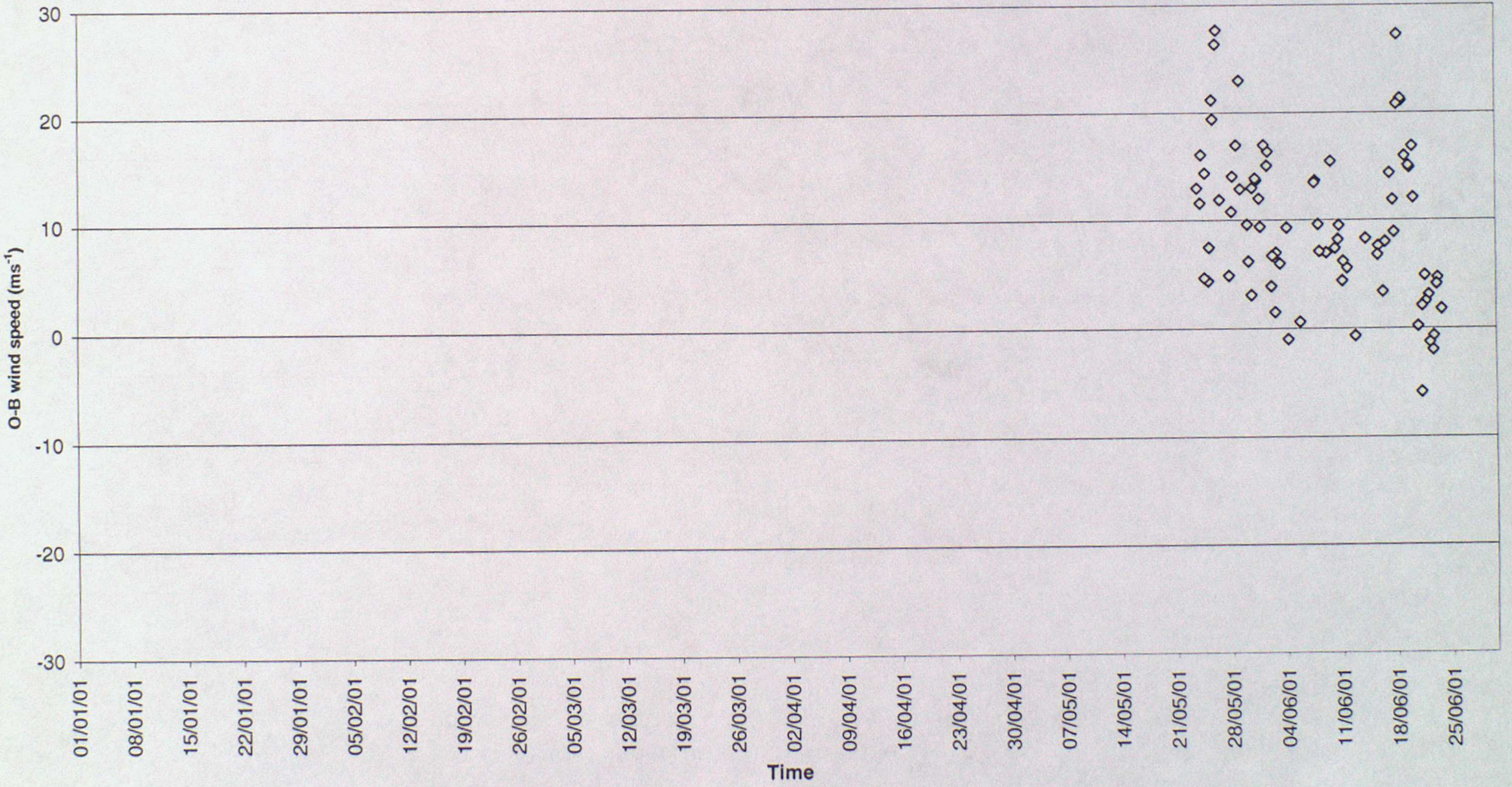


O-B wind speed ($ms^{-1}$) for identifier OWRN2

Number of obs. plotted = 154    Number of outliers = 1

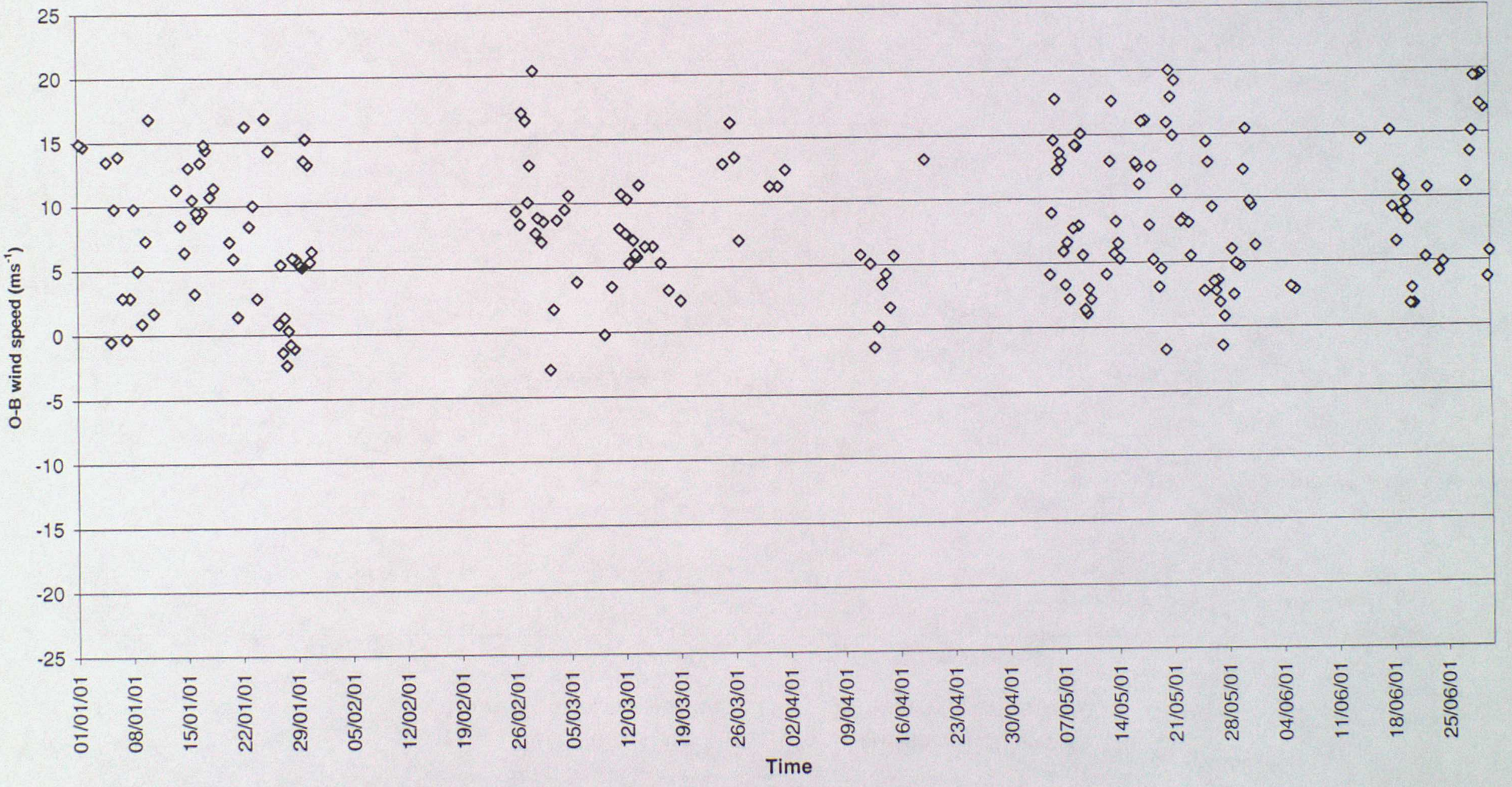


O-B wind speed (ms-1) for identifier OYBZ
Number of obs. plotted = 113    Number of outliers = 0

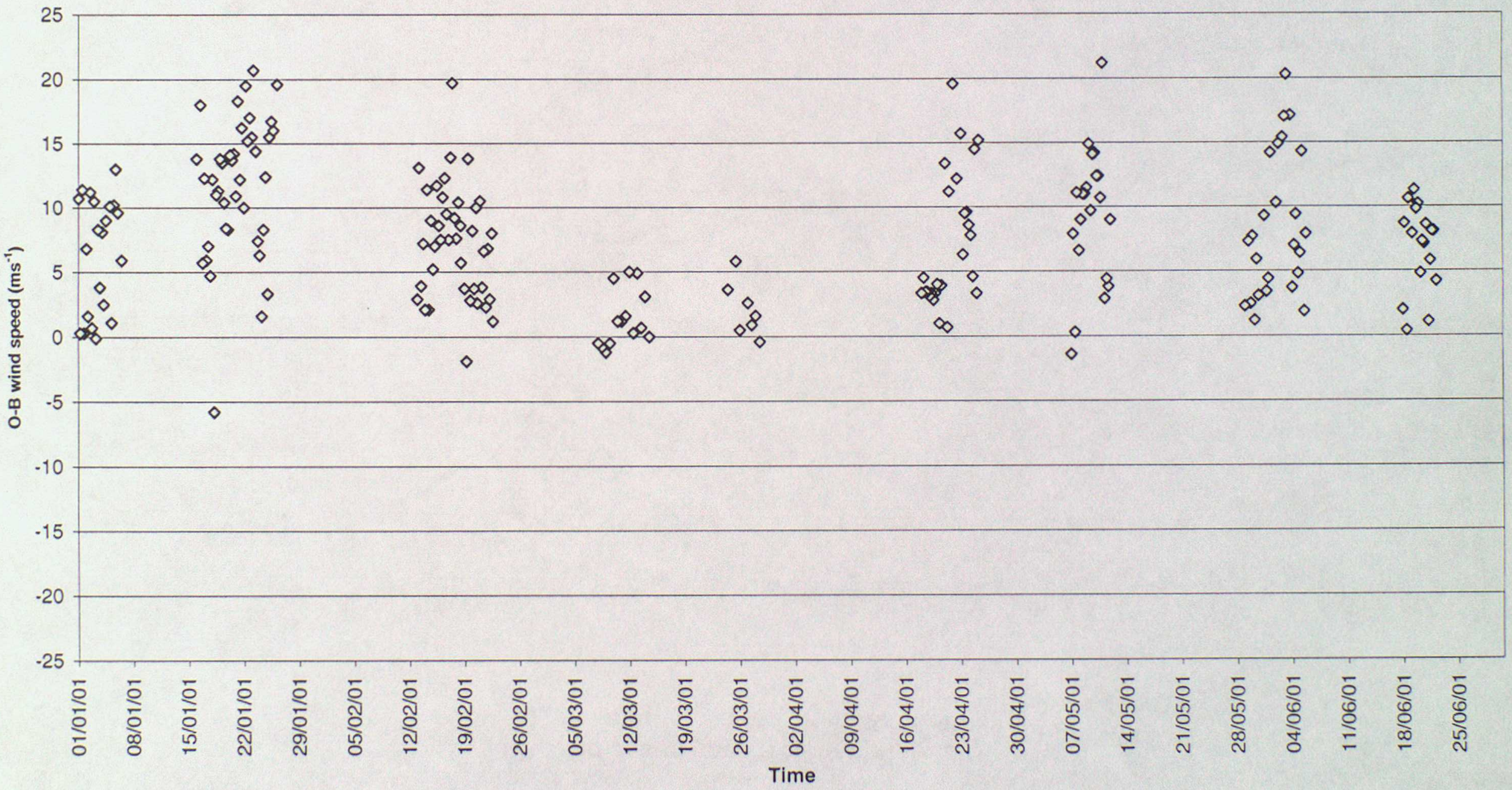


O-B wind speed (ms-1) for identifier OYCZ
Number of obs. plotted = 79    Number of outliers = 0

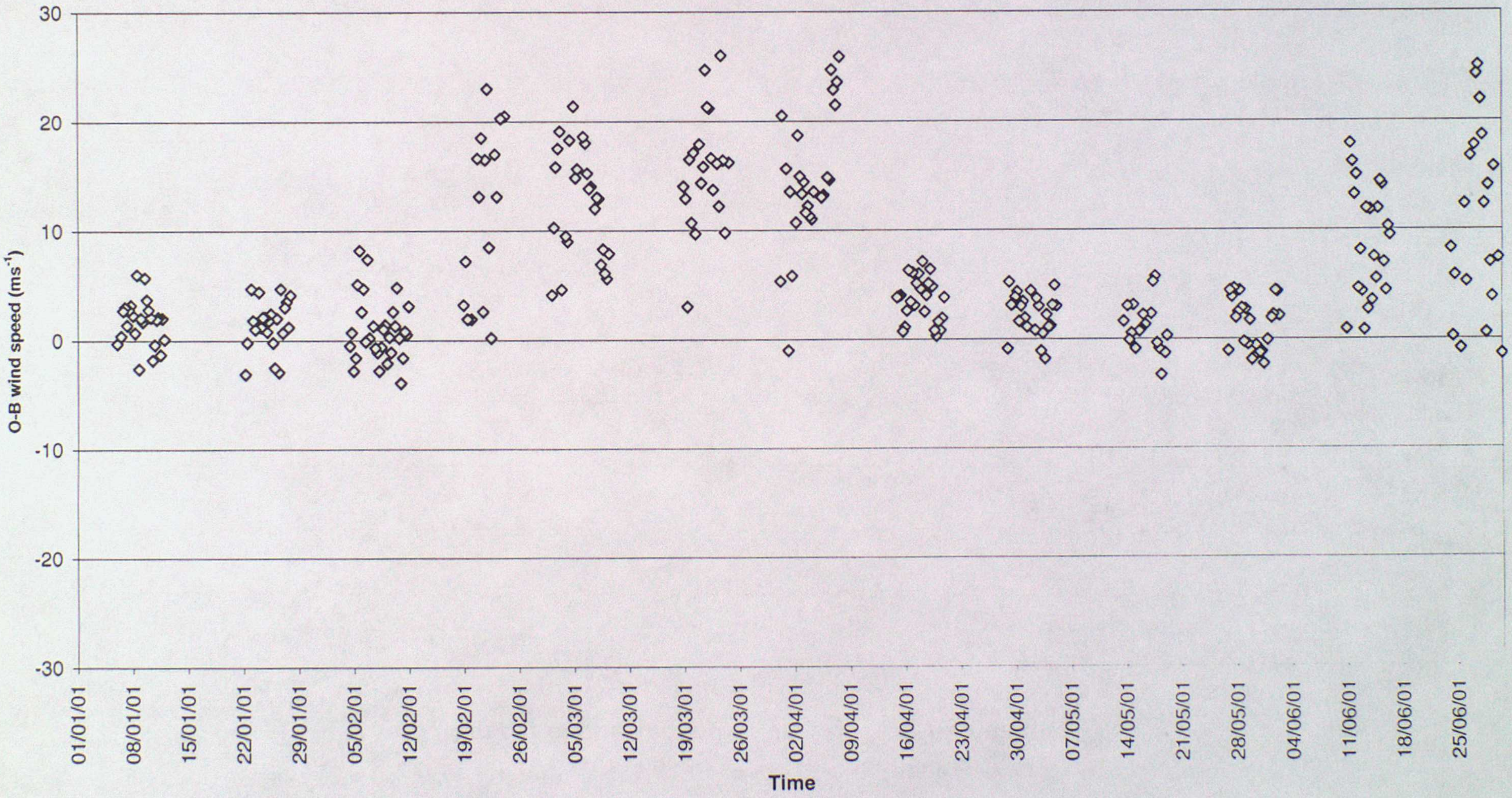
O-B wind speed ($ms^{-1}$) for identifier PJIB
Number of obs. plotted = 202    Number of outliers = 1

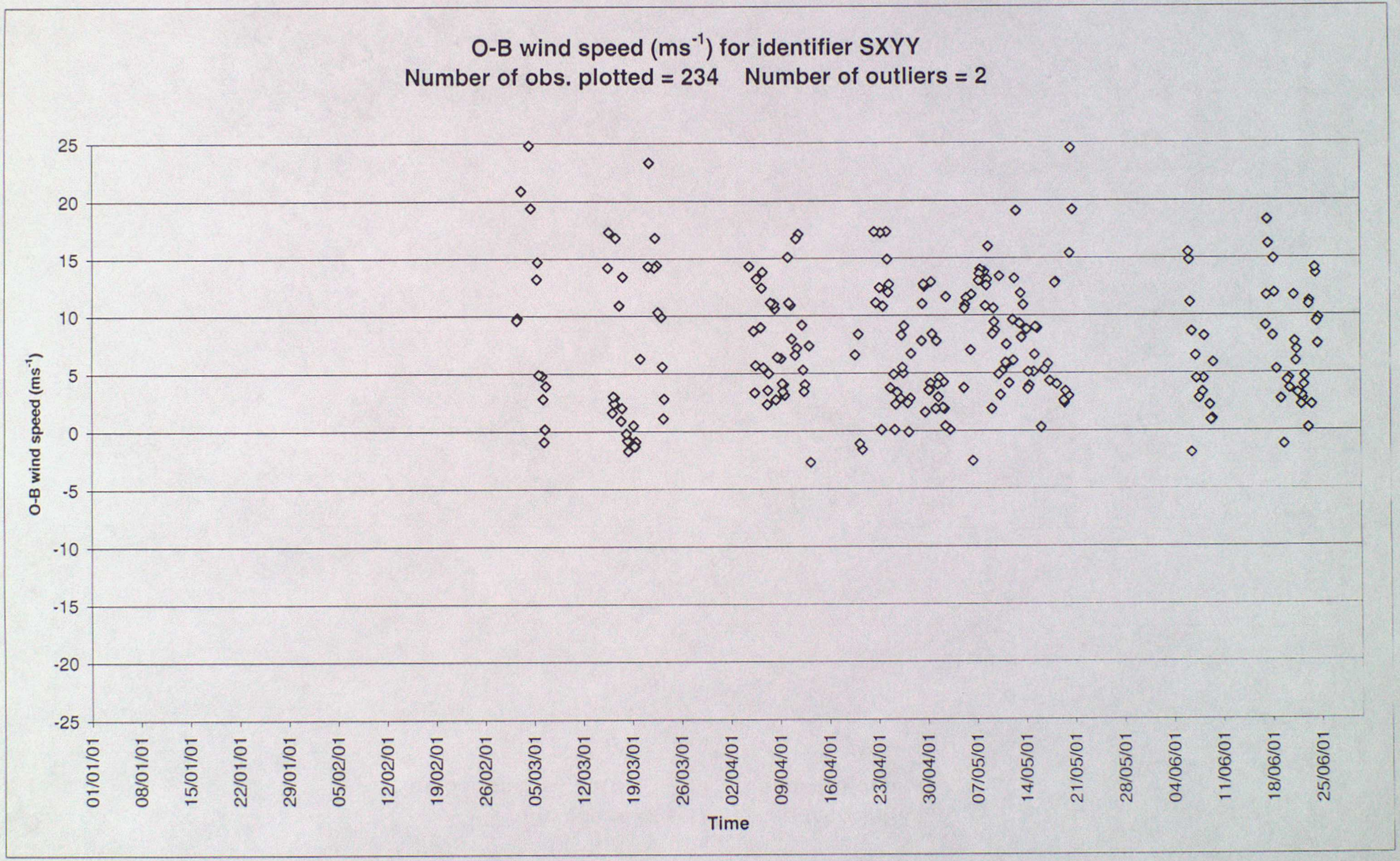


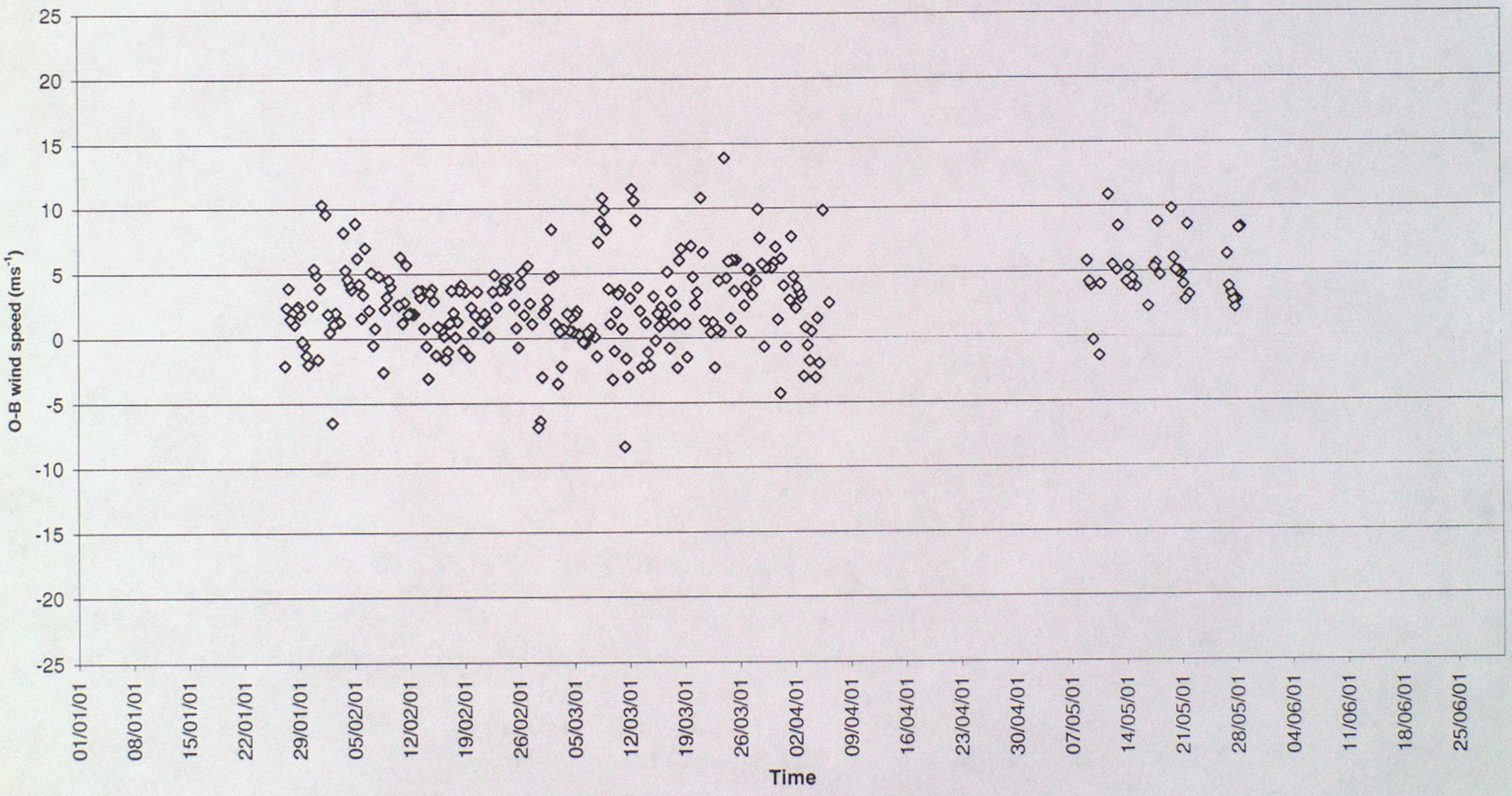
O-B wind speed (ms$^{-1}$) for identifier PPSO
Number of obs. plotted = 211    Number of outliers = 0



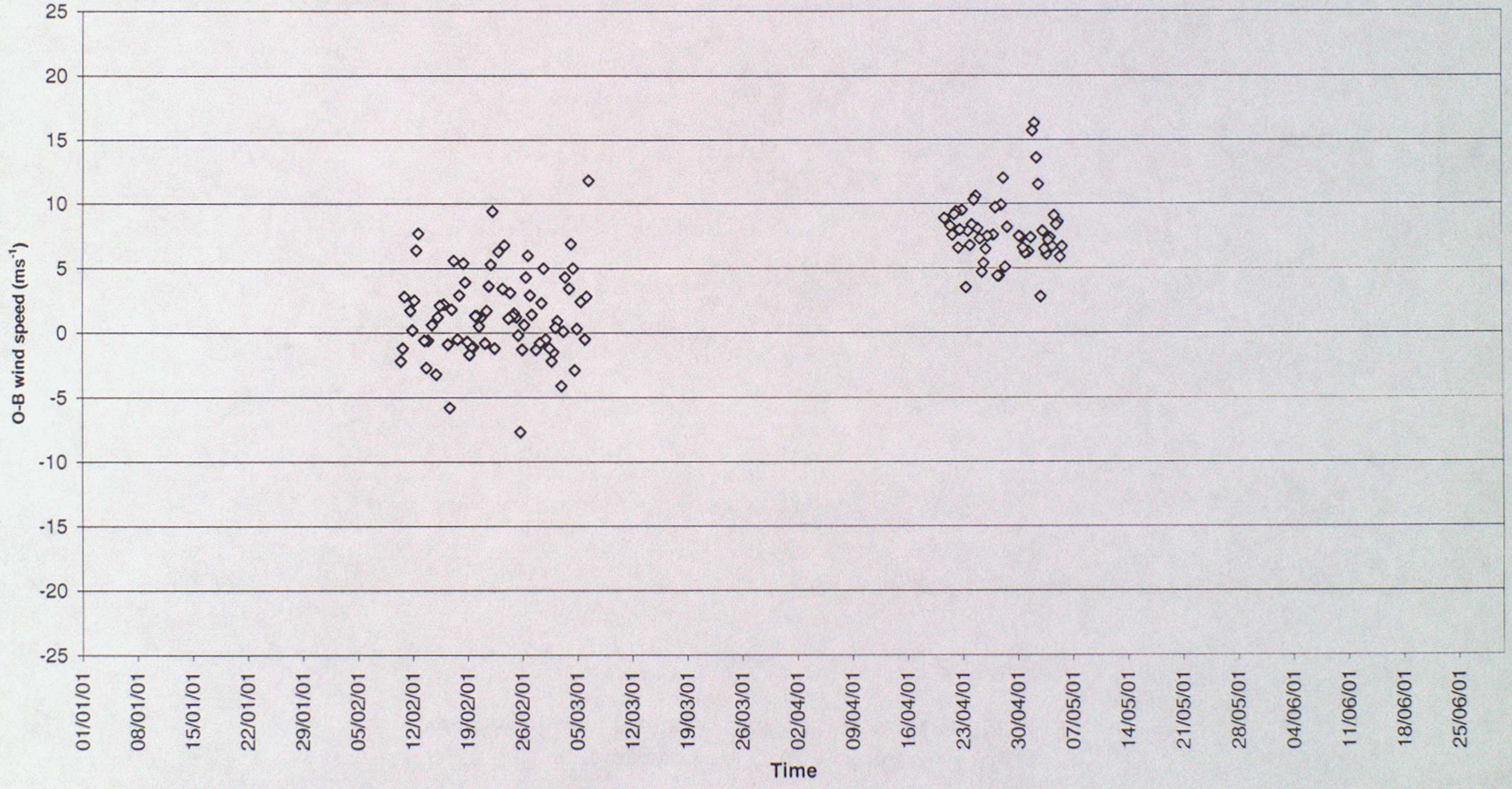
O-B wind speed (ms-1) for identifier SFRZ
Number of obs. plotted = 296    Number of outliers = 0




O-B wind speed (ms$^{-1}$) for identifier SXYY
Number of obs. plotted = 234    Number of outliers = 2
O-B wind speed (ms$^{-1}$)
25
20
15
10
5
0
-5
-10
-15
-20
-25
01/01/01
08/01/01
15/01/01
22/01/01
29/01/01
05/02/01
12/02/01
19/02/01
26/02/01
05/03/01
12/03/01
19/03/01
26/03/01
02/04/01
09/04/01
16/04/01
23/04/01
30/04/01
07/05/01
14/05/01
21/05/01
28/05/01
04/06/01
11/06/01
18/06/01
25/06/01
Time

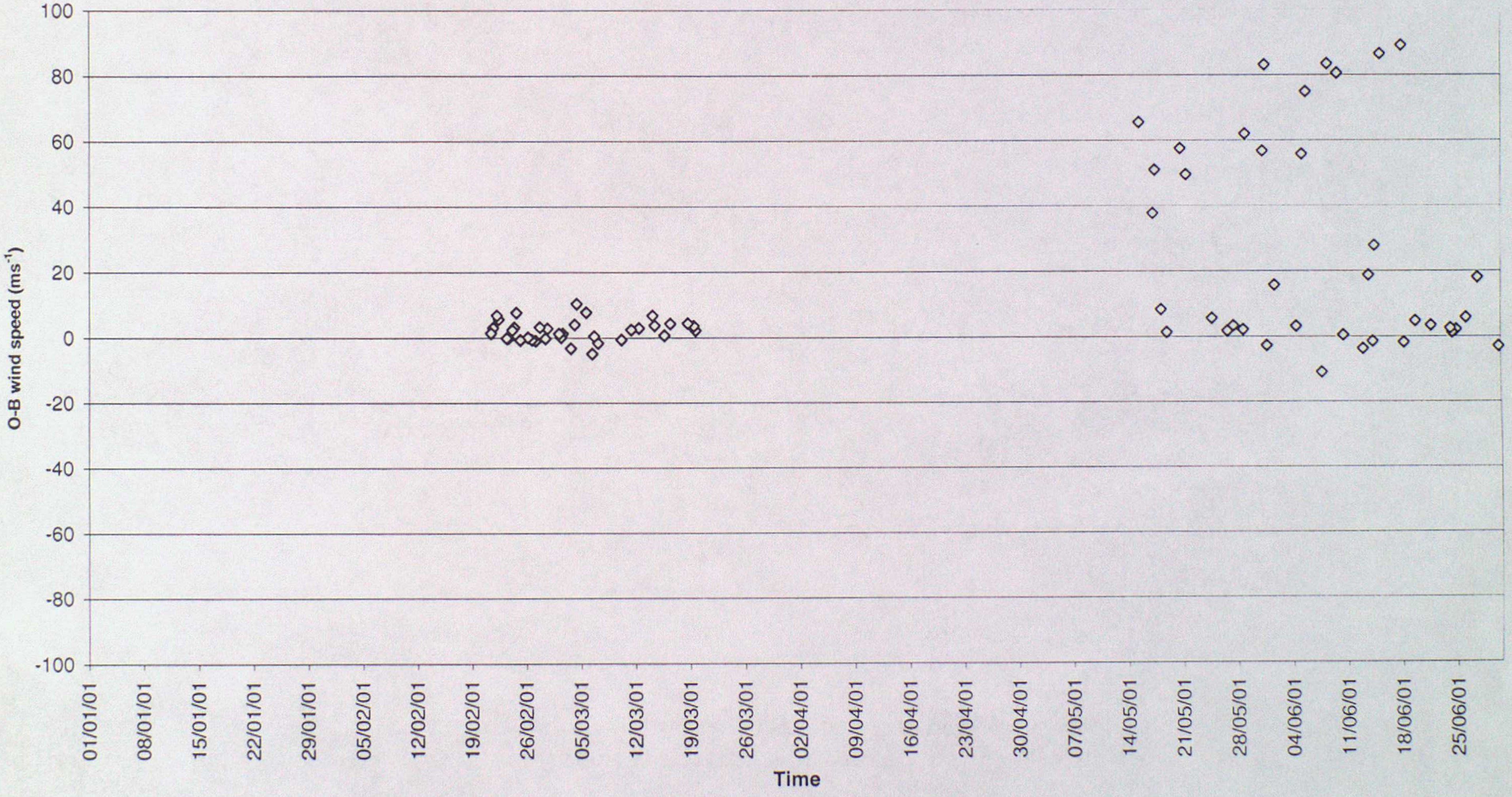


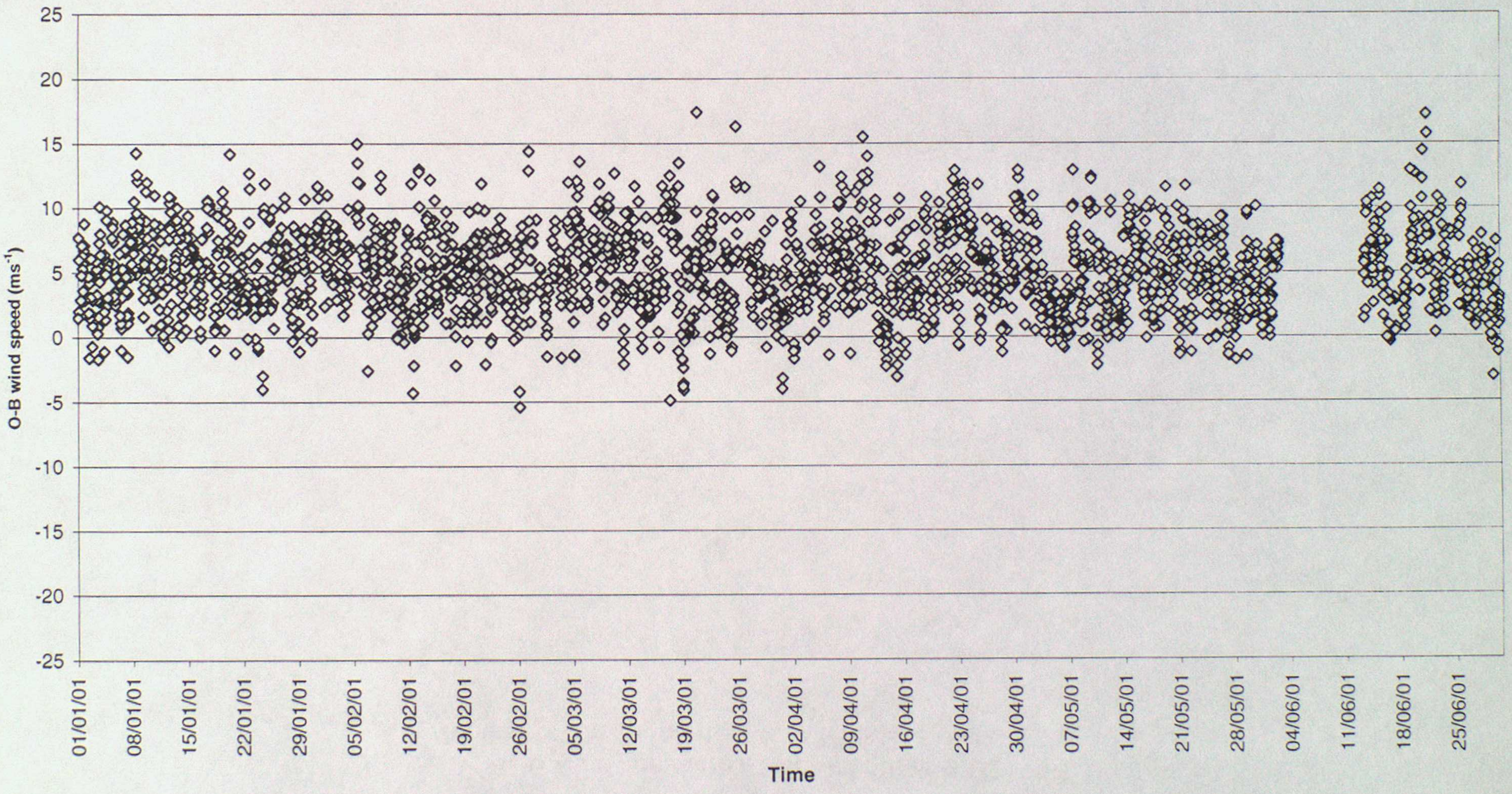
O-B wind speed (ms$^{-1}$) for identifier UCJU
Number of obs. plotted = 273    Number of outliers = 7



O-B wind speed ($ms^{-1}$) for identifier UCUE
Number of obs. plotted = 126    Number of outliers = 1

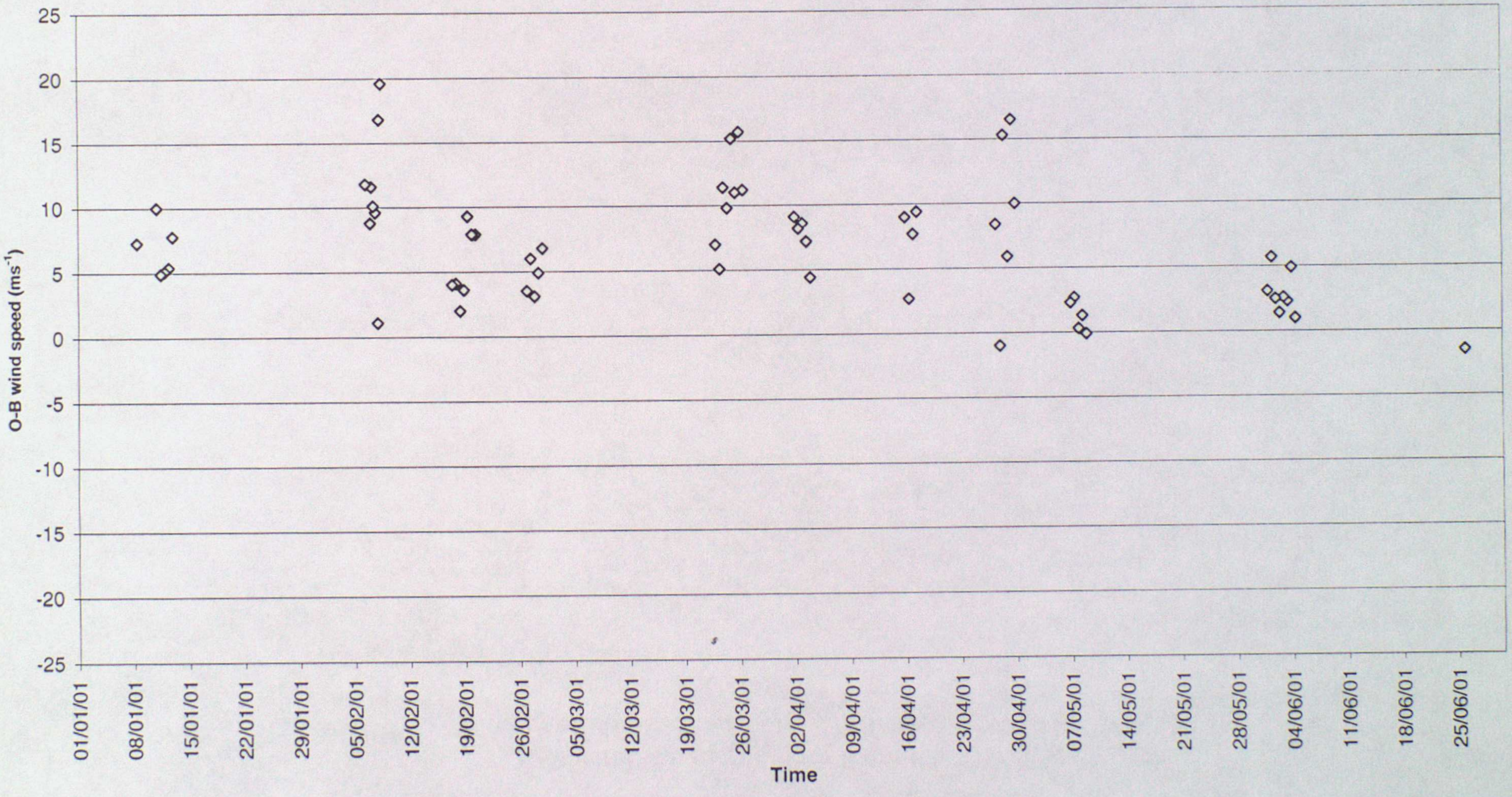
O-B wind speed (ms-1) for identifier UIDS
Number of obs. plotted = 74    Number of outliers = 0



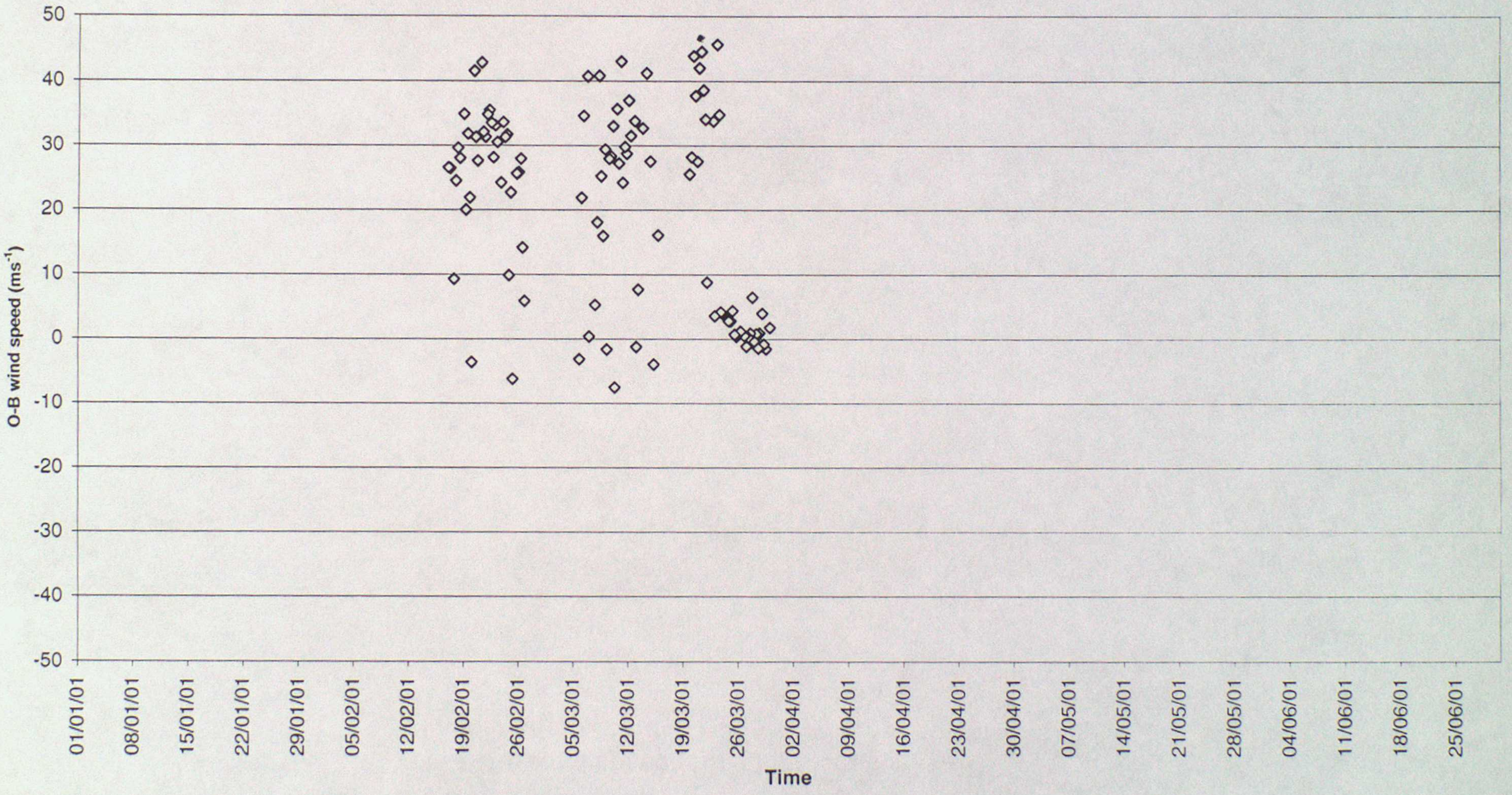

O-B wind speed (ms$^{-1}$) for identifier VLST

Number of obs. plotted = 2359    Number of outliers = 0

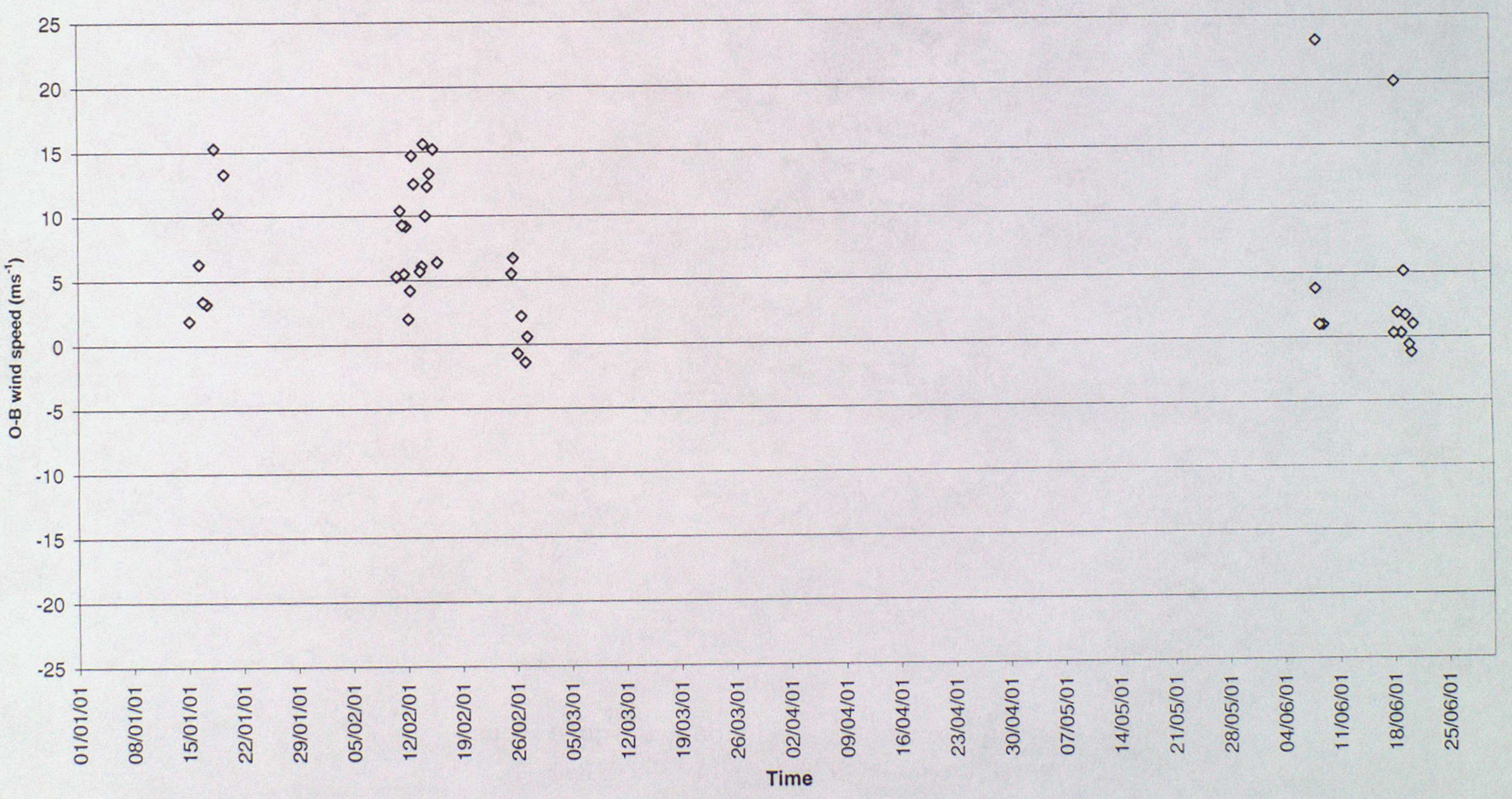
O-B wind speed ($ms^{-1}$) for identifier VRRD
Number of obs. plotted = 63    Number of outliers = 0

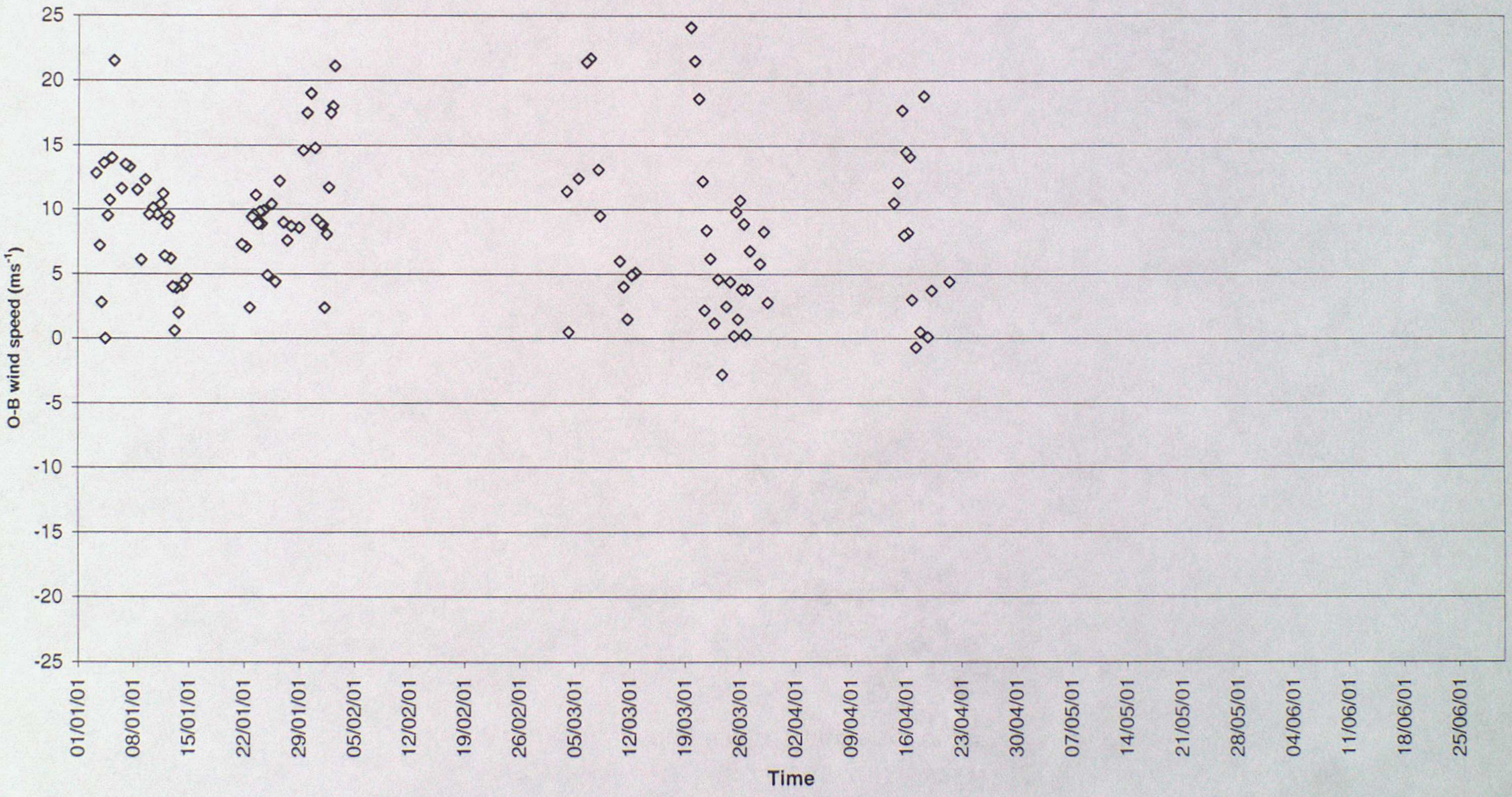


O-B wind speed (ms$^{-1}$) for identifier VRVJ5
Number of obs. plotted = 102    Number of outliers = 0



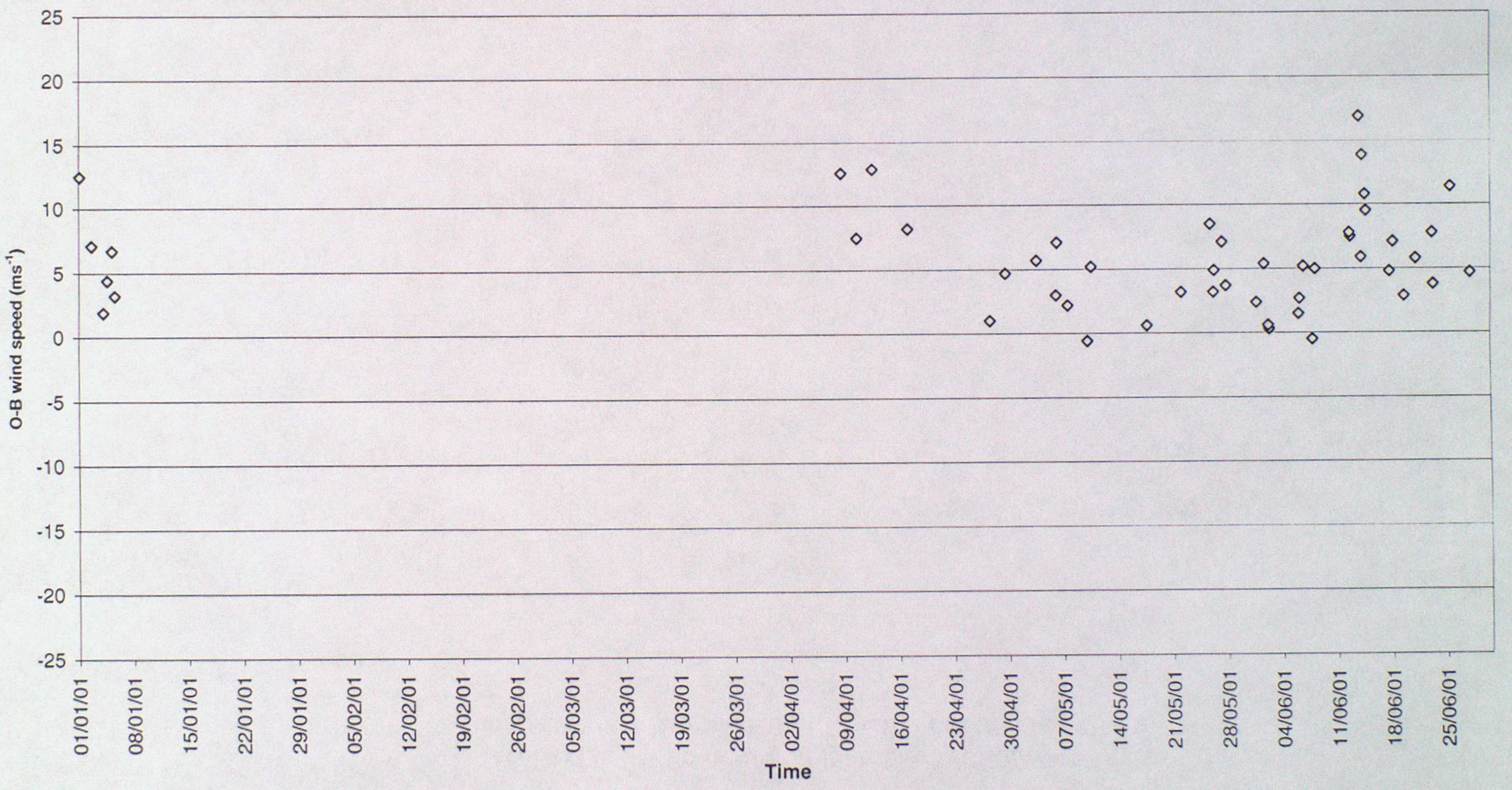
O-B wind speed ($ms^{-1}$) for identifier V2FN
Number of obs. plotted = 43    Number of outliers = 0



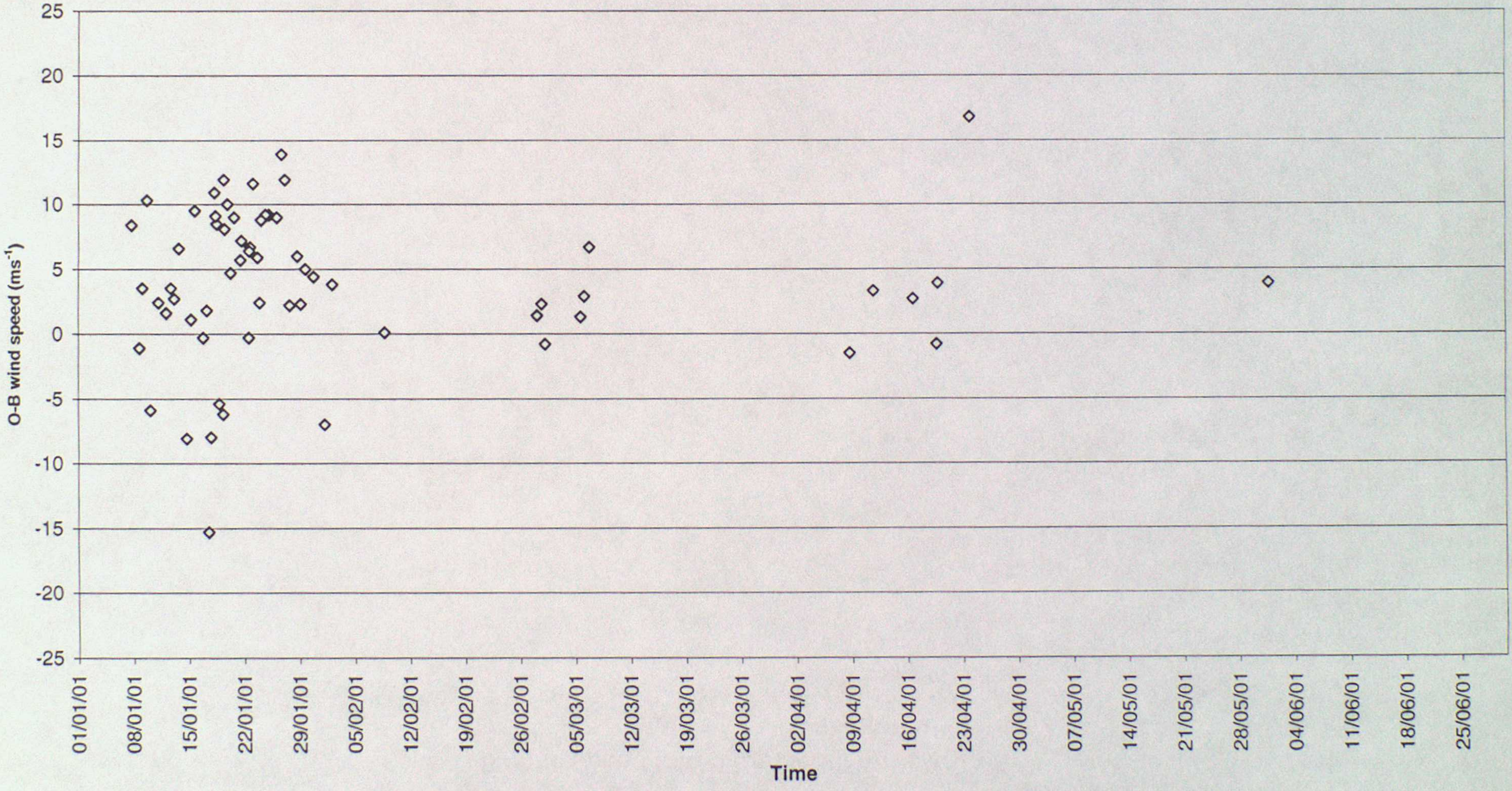


O-B wind speed (ms$^{-1}$) for identifier V2PB1
Number of obs. plotted = 111    Number of outliers = 3

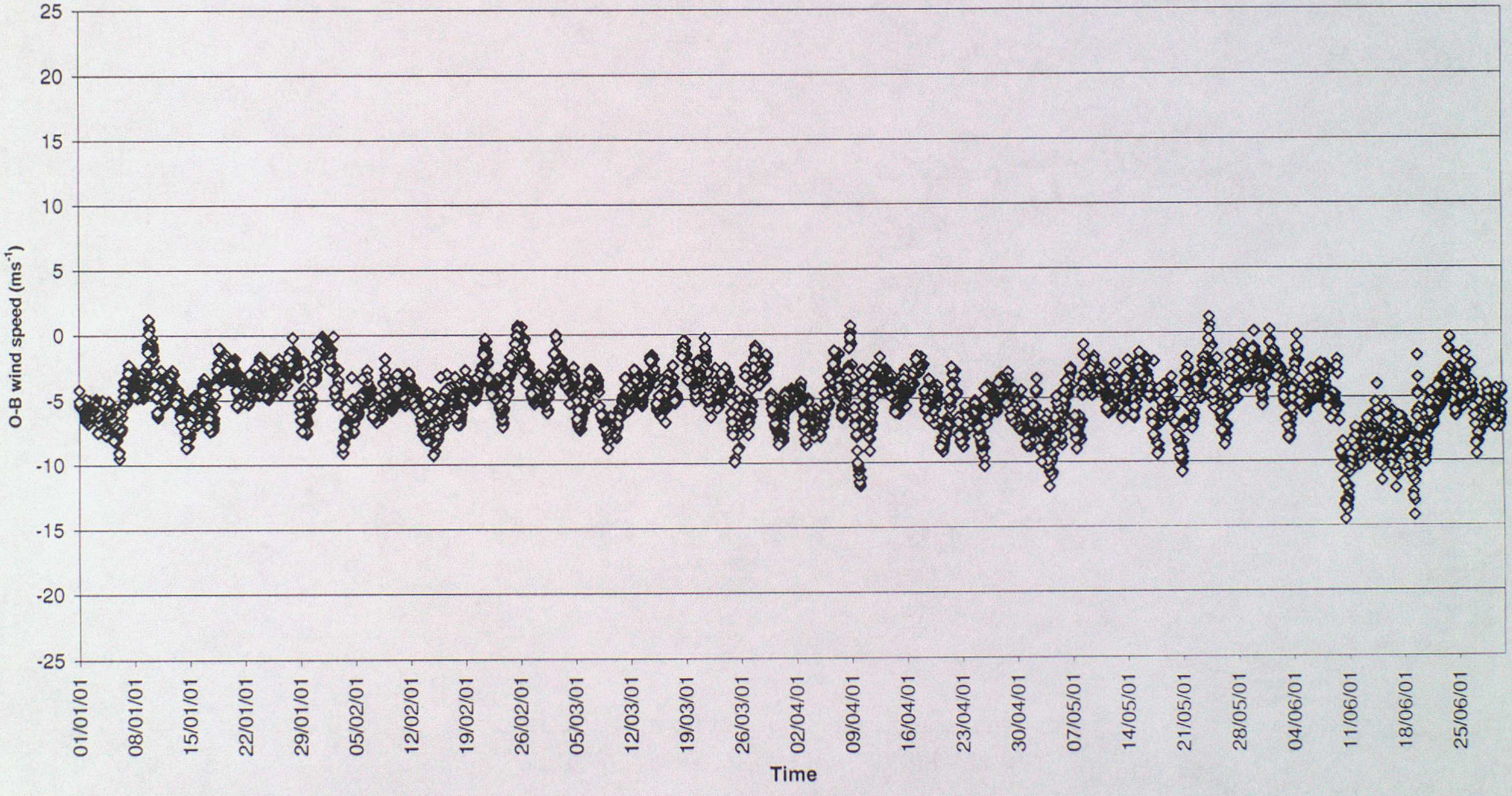
O-B wind speed ($ms^{-1}$) for identifier WAQ3521
Number of obs. plotted = 49    Number of outliers = 0

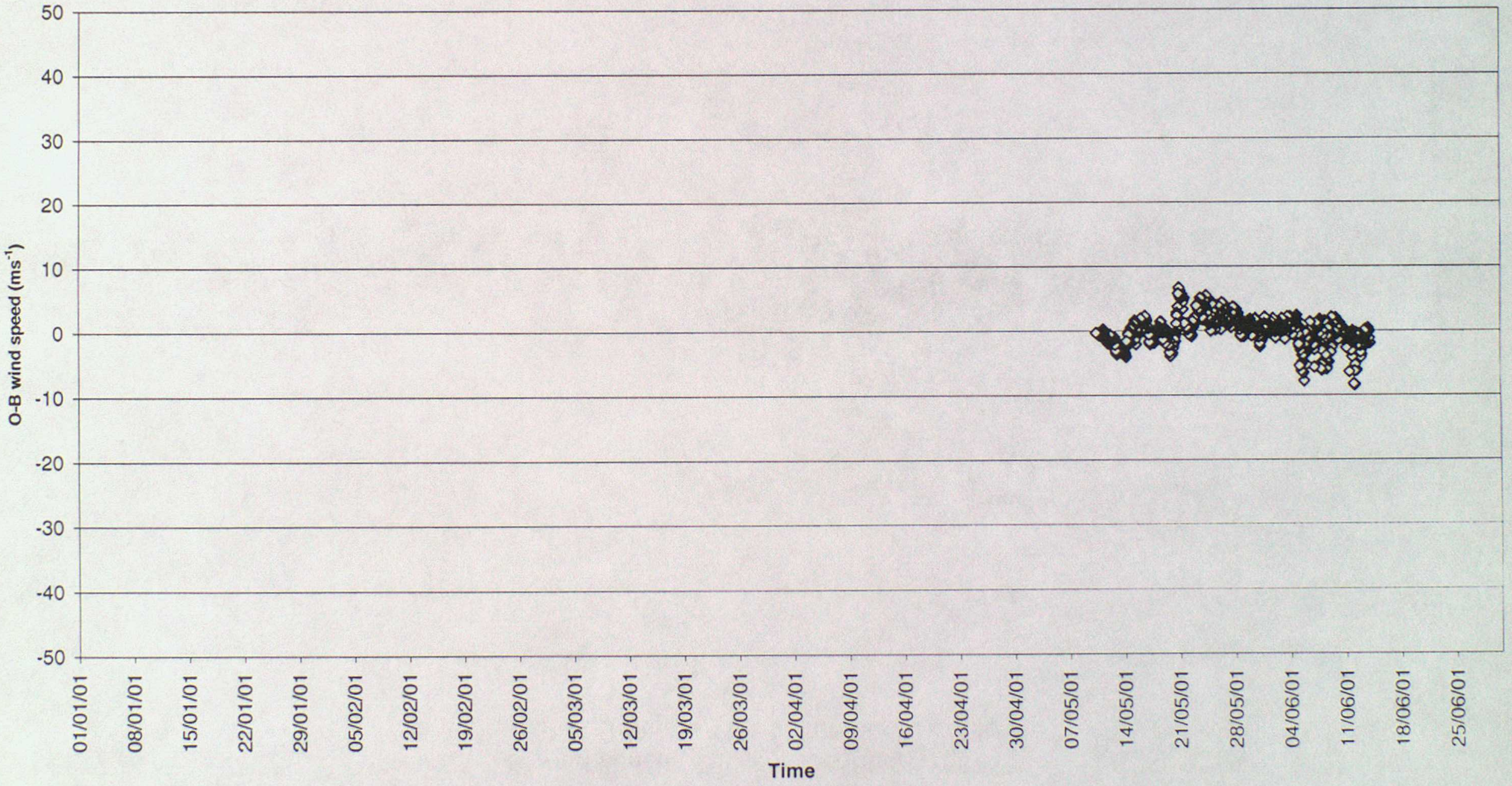


O-B wind speed ($ms^{-1}$) for identifier WCP9556
Number of obs. plotted = 62    Number of outliers = 0

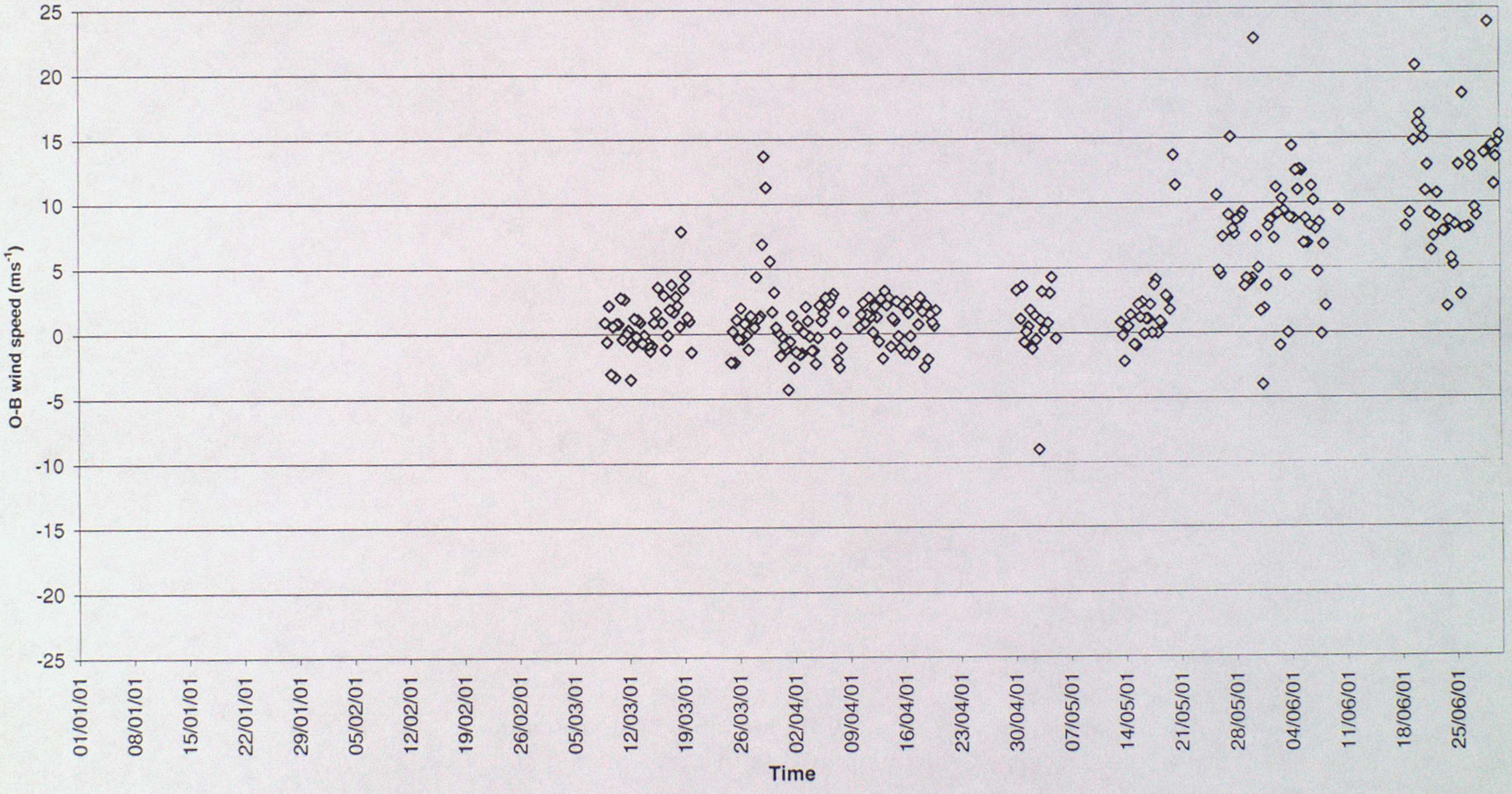


O-B wind speed (ms$^{-1}$) for identifier 17557
Number of obs. plotted = 4235    Number of outliers = 0

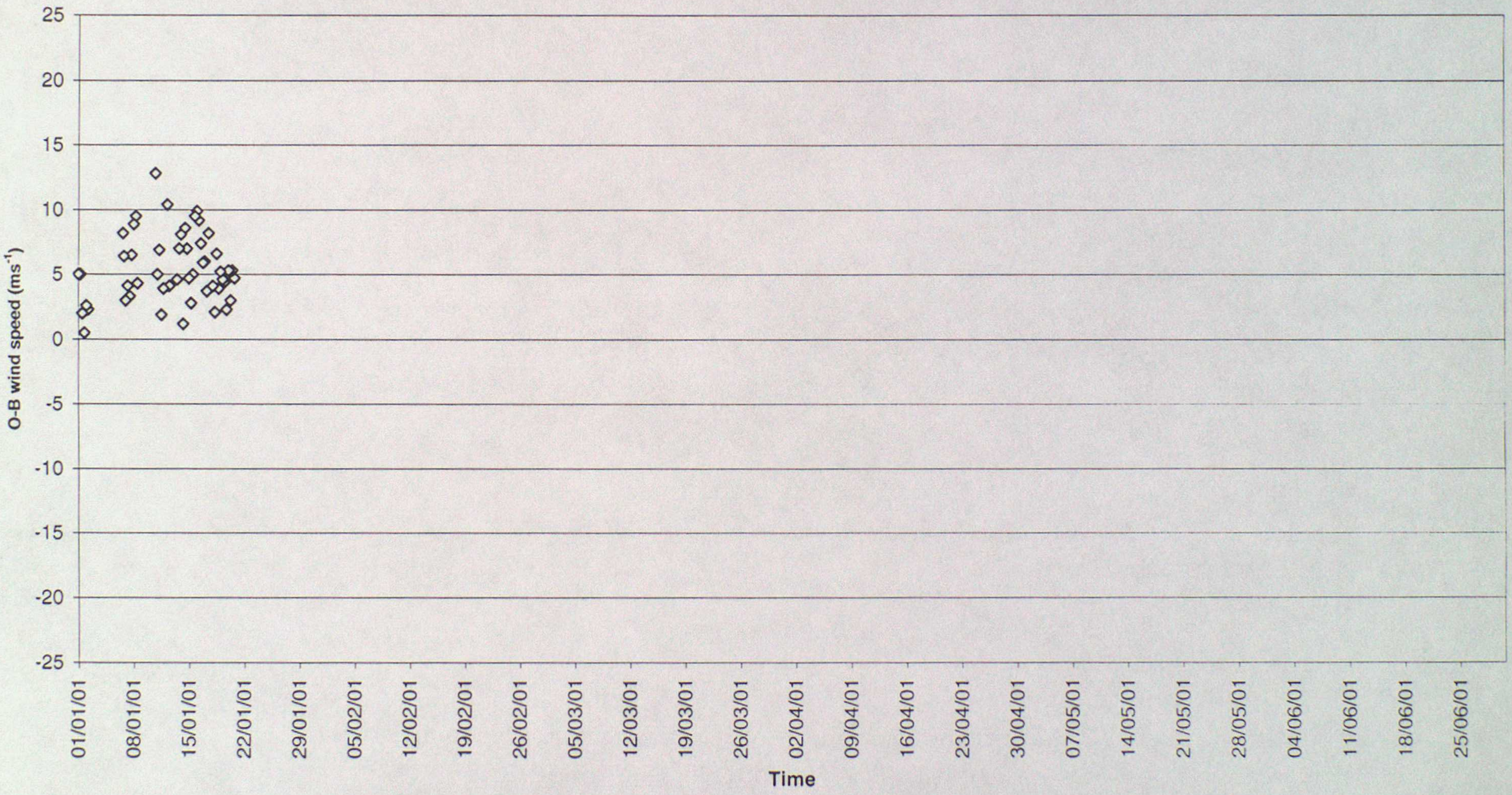



O-B wind speed ($ms^{-1}$) for identifier 23913
Number of obs. plotted = 772    Number of outliers = 0

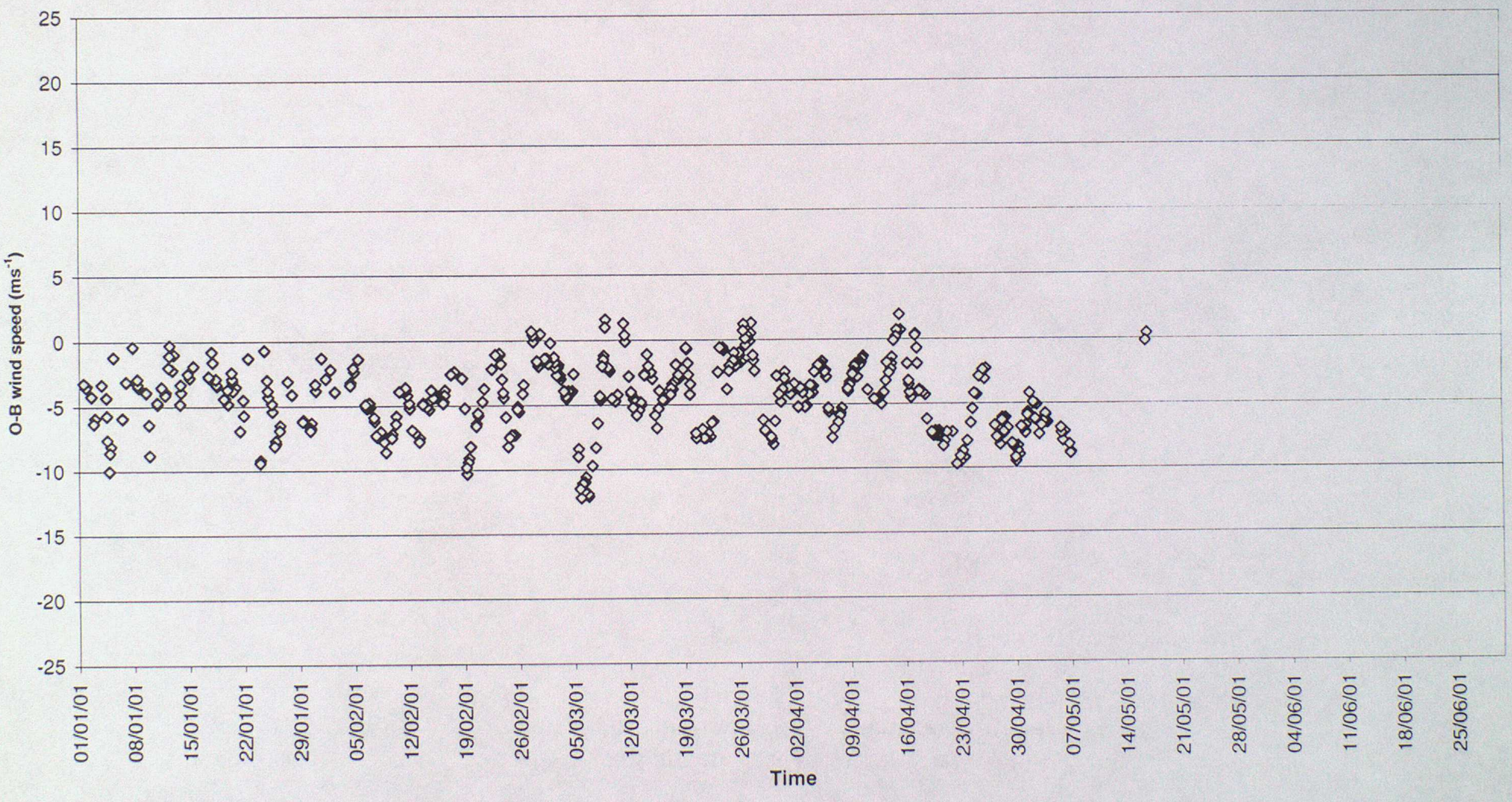
O-B wind speed ($ms^{-1}$) for identifier 3ESP7
Number of obs. plotted = 276    Number of outliers = 0



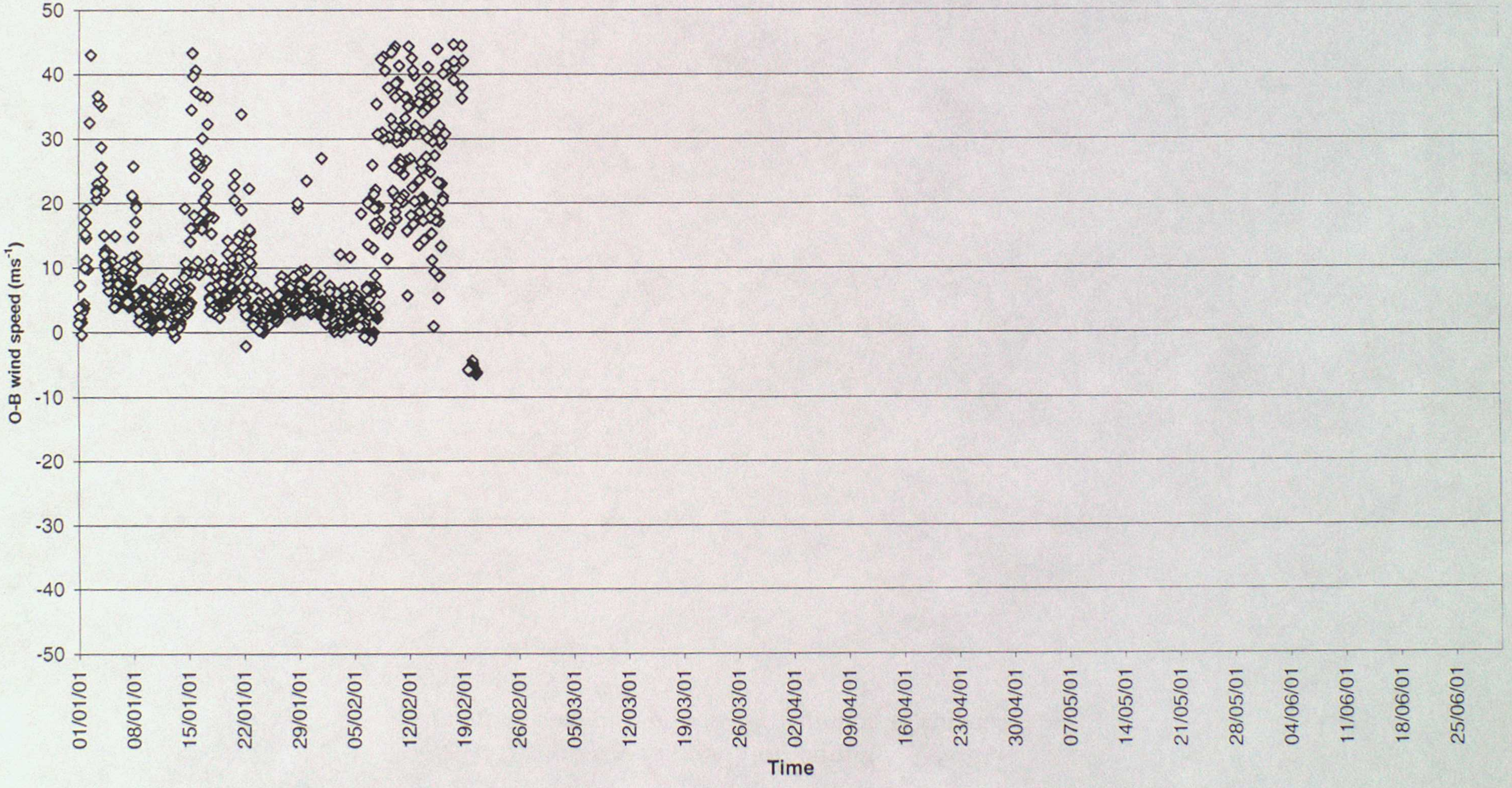
O-B wind speed ($ms^{-1}$) for identifier 3FWM4
Number of obs. plotted = 51    Number of outliers = 0



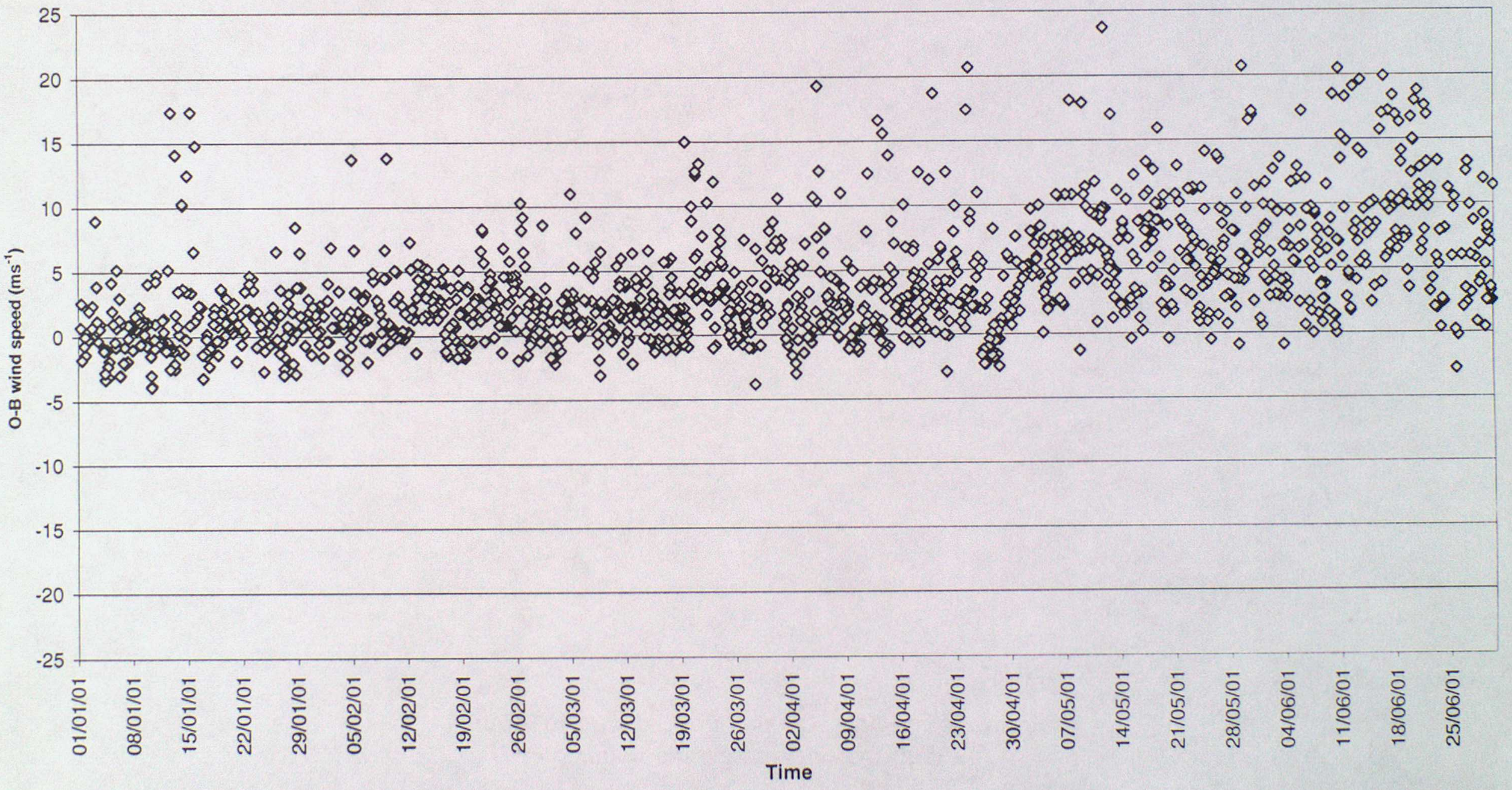
O-B wind speed ($ms^{-1}$) for identifier 41502
Number of obs. plotted = 476    Number of outliers = 0

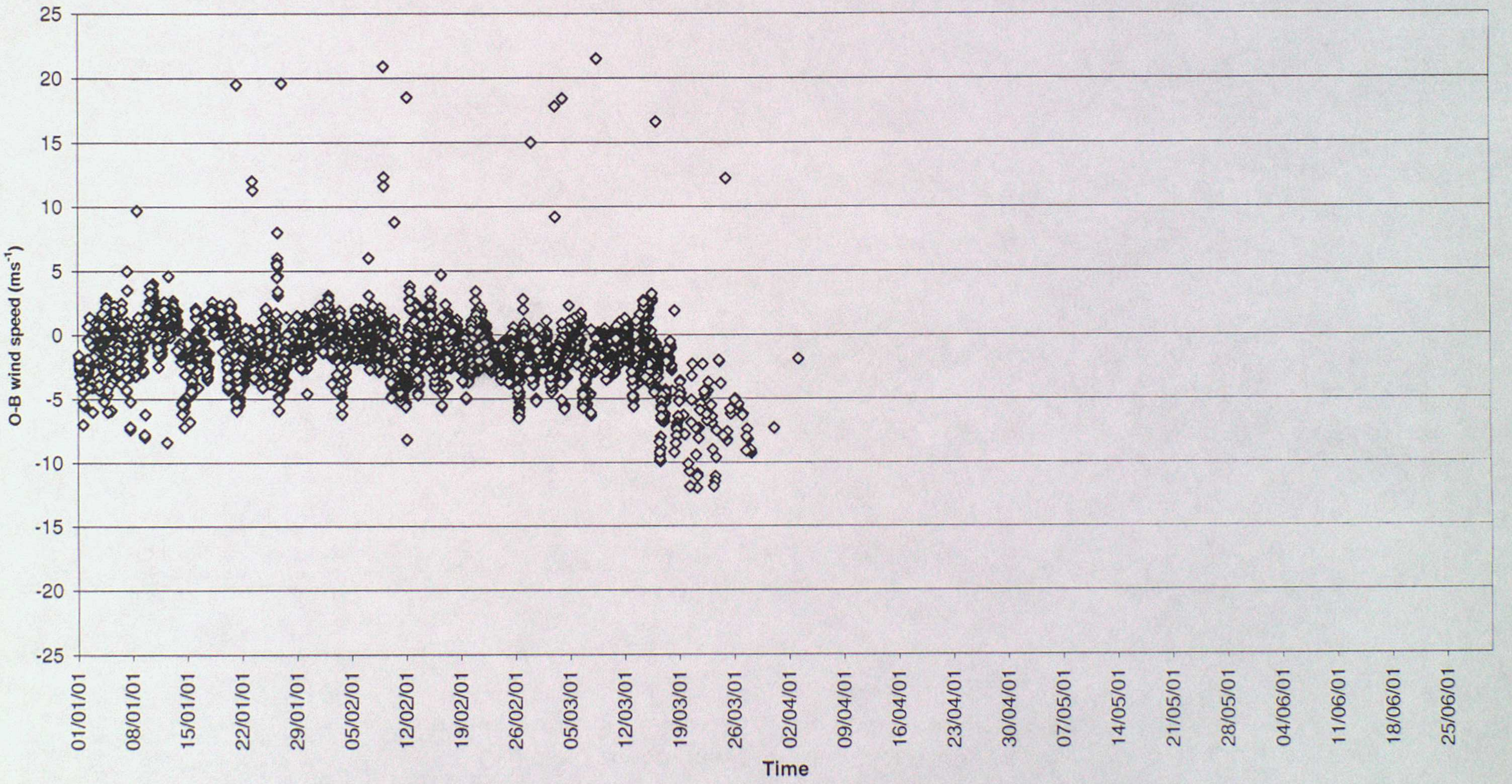


O-B wind speed ($ms^{-1}$) for identifier 41594
Number of obs. plotted = 790    Number of outliers = 0



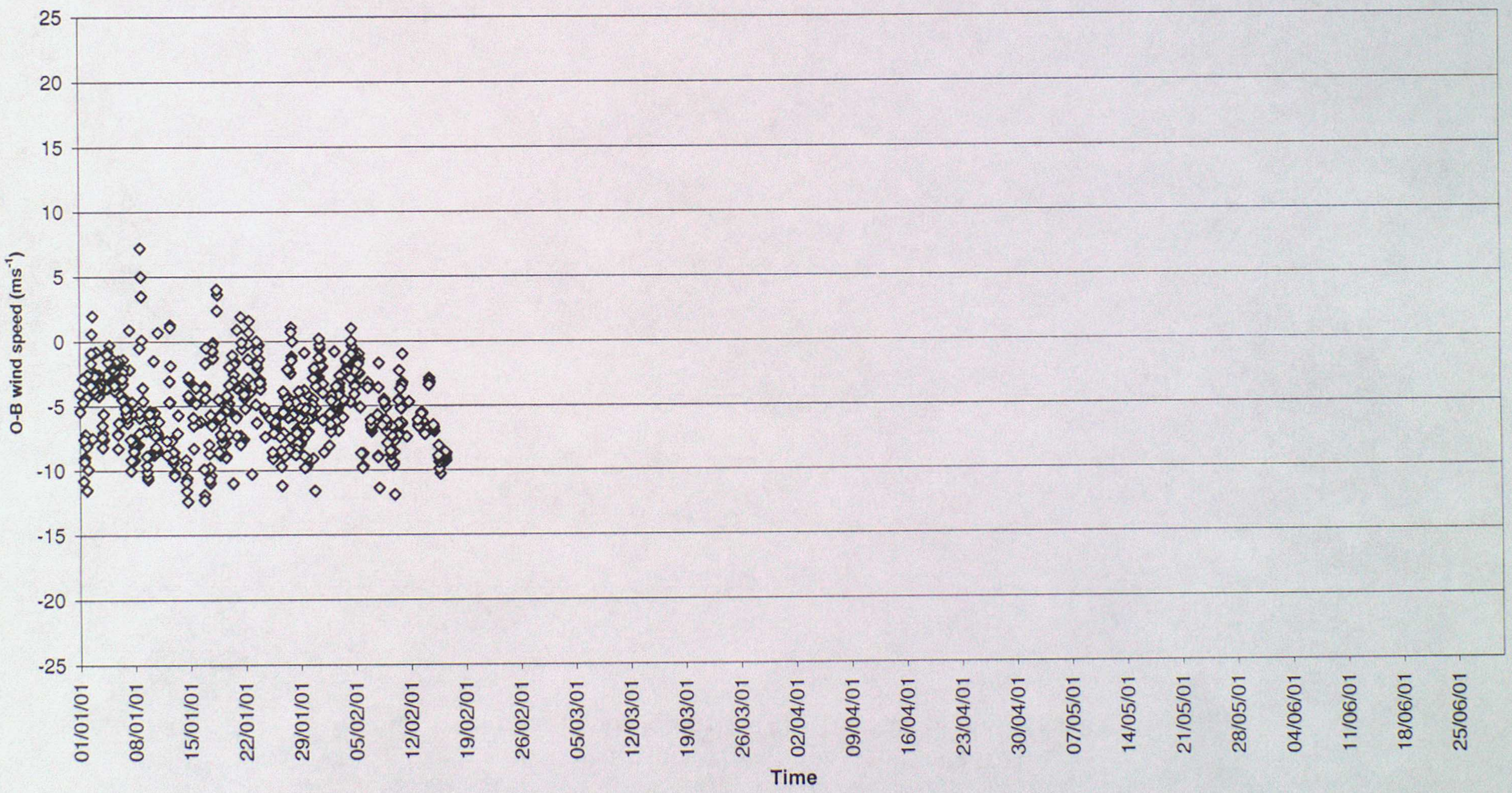
O-B wind speed ($ms^{-1}$) for identifier 41639
Number of obs. plotted = 1363    Number of outliers = 4



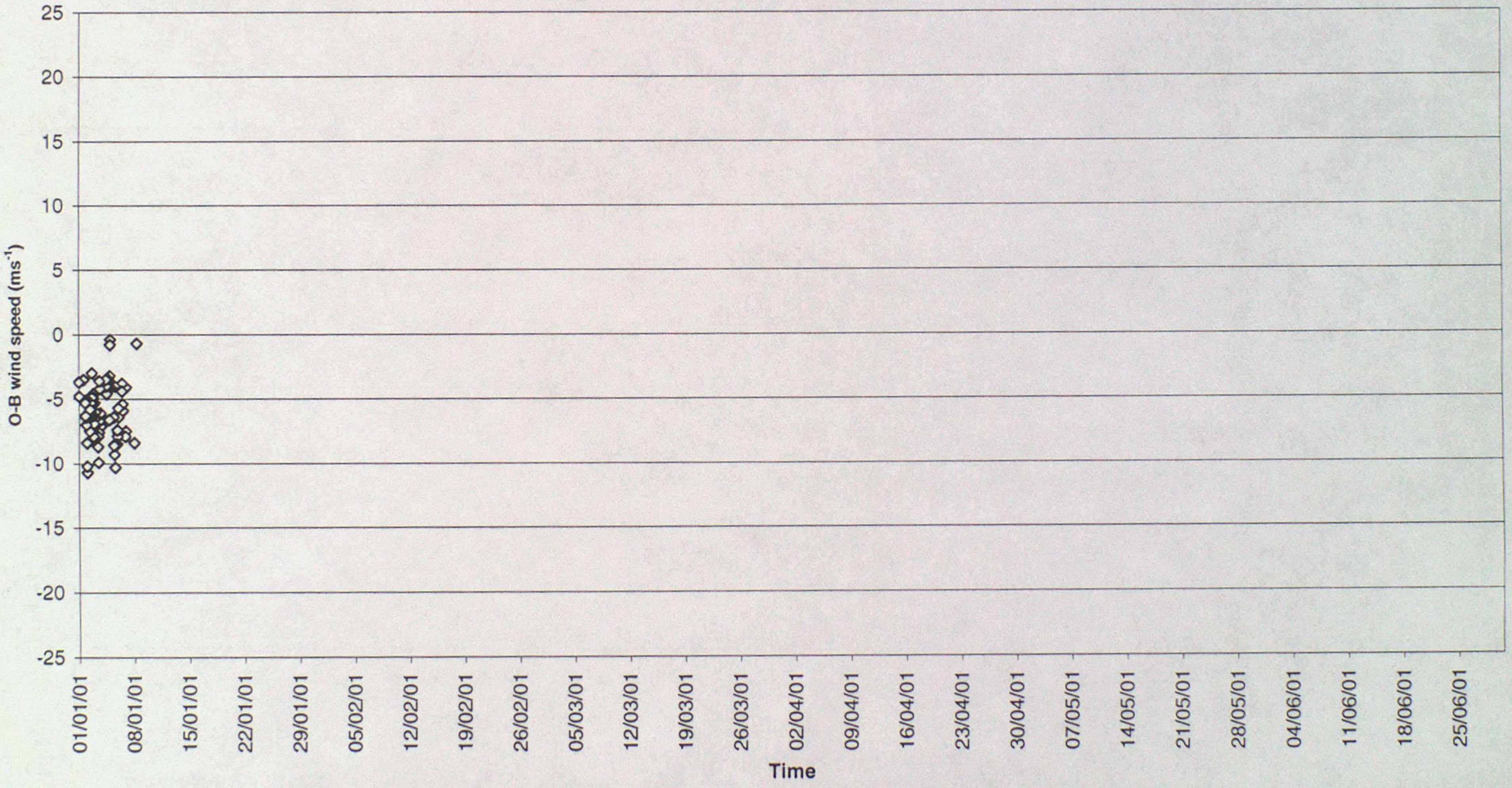


O-B wind speed ($ms^{-1}$) for identifier 44743
Number of obs. plotted = 3222    Number of outliers = 0

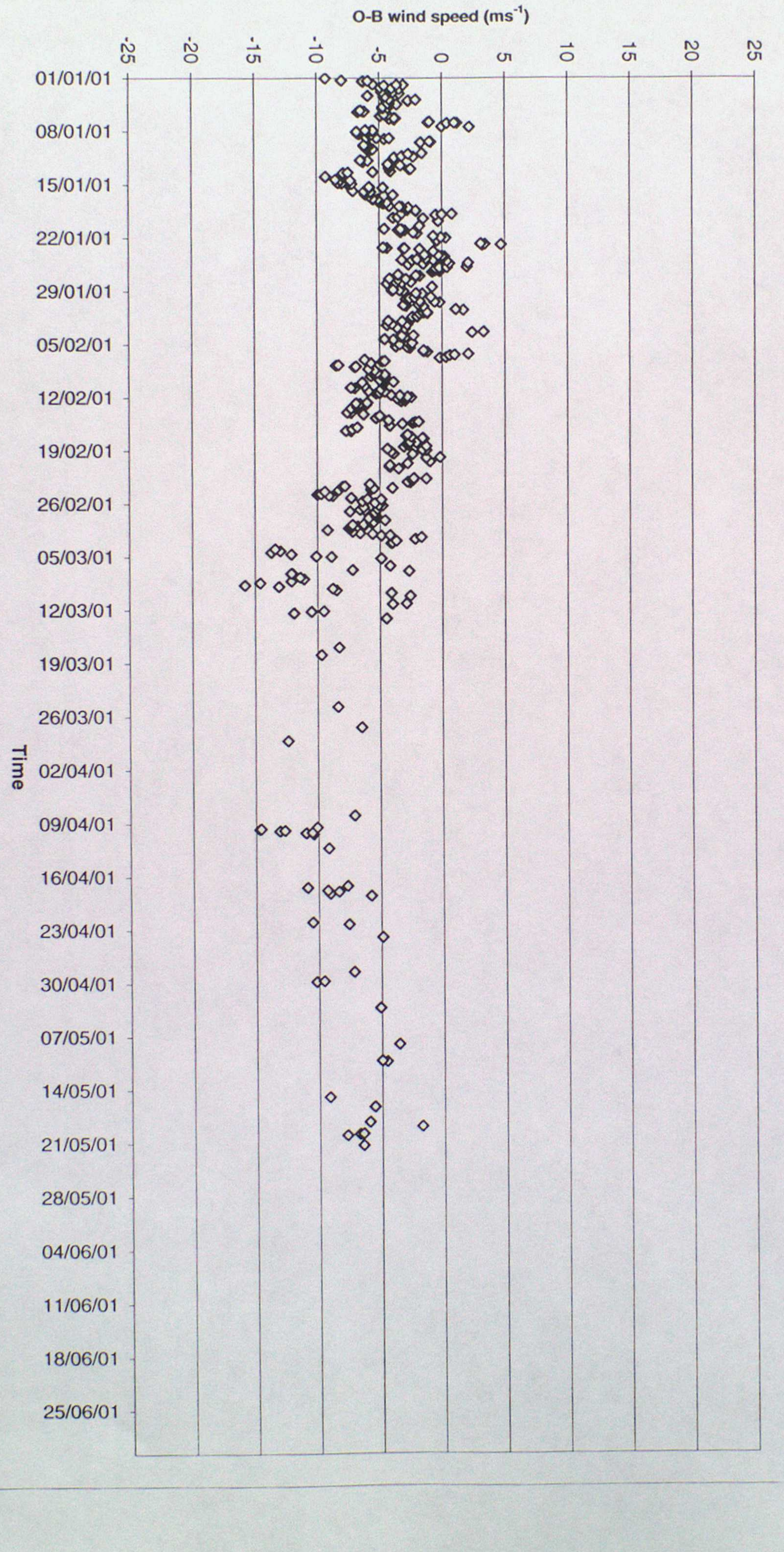
O-B wind speed ($ms^{-1}$) for identifier 46660
Number of obs. plotted = 506    Number of outliers = 0



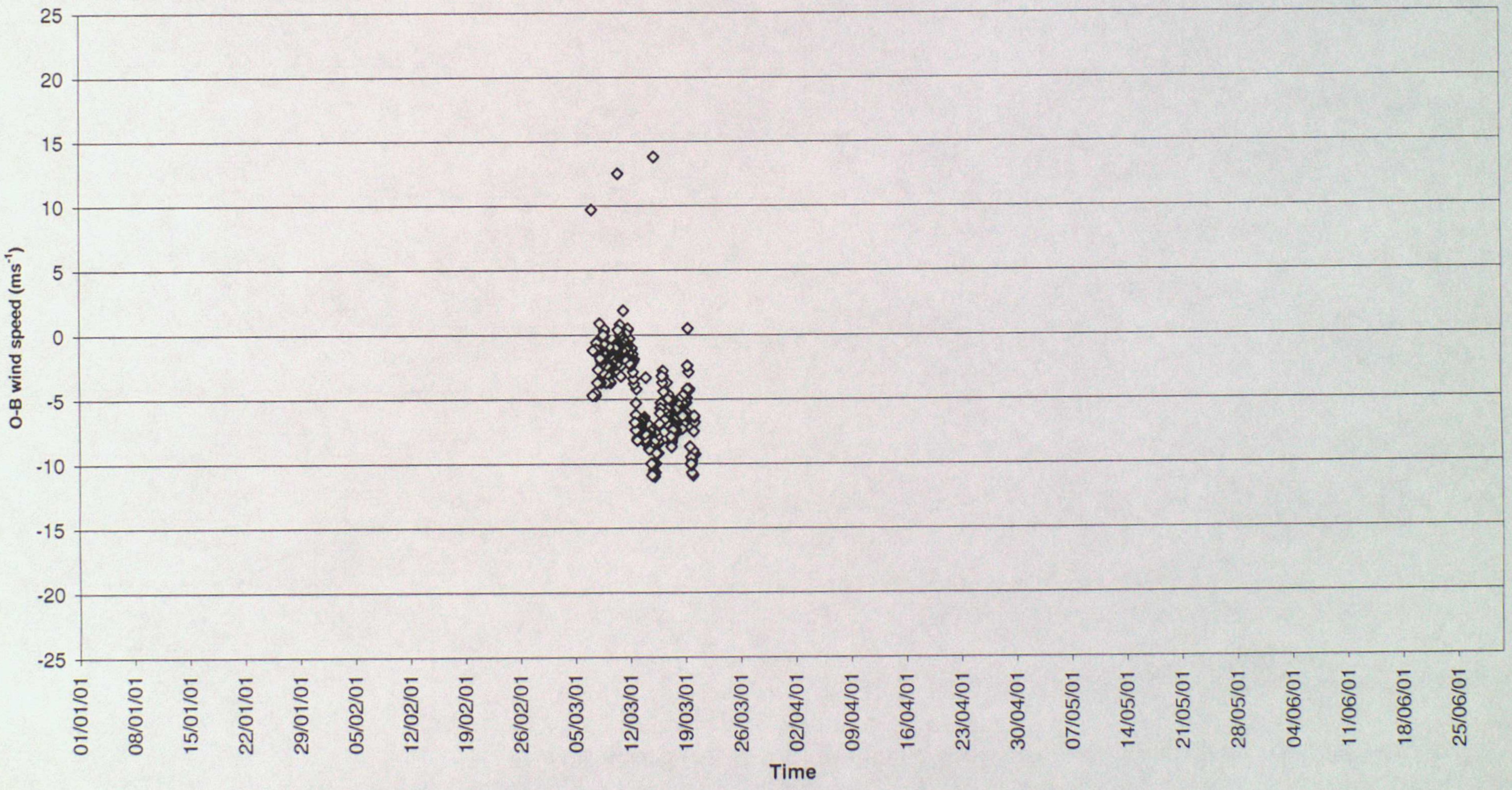
O-B wind speed ($ms^{-1}$) for identifier 46701
Number of obs. plotted = 73    Number of outliers = 0

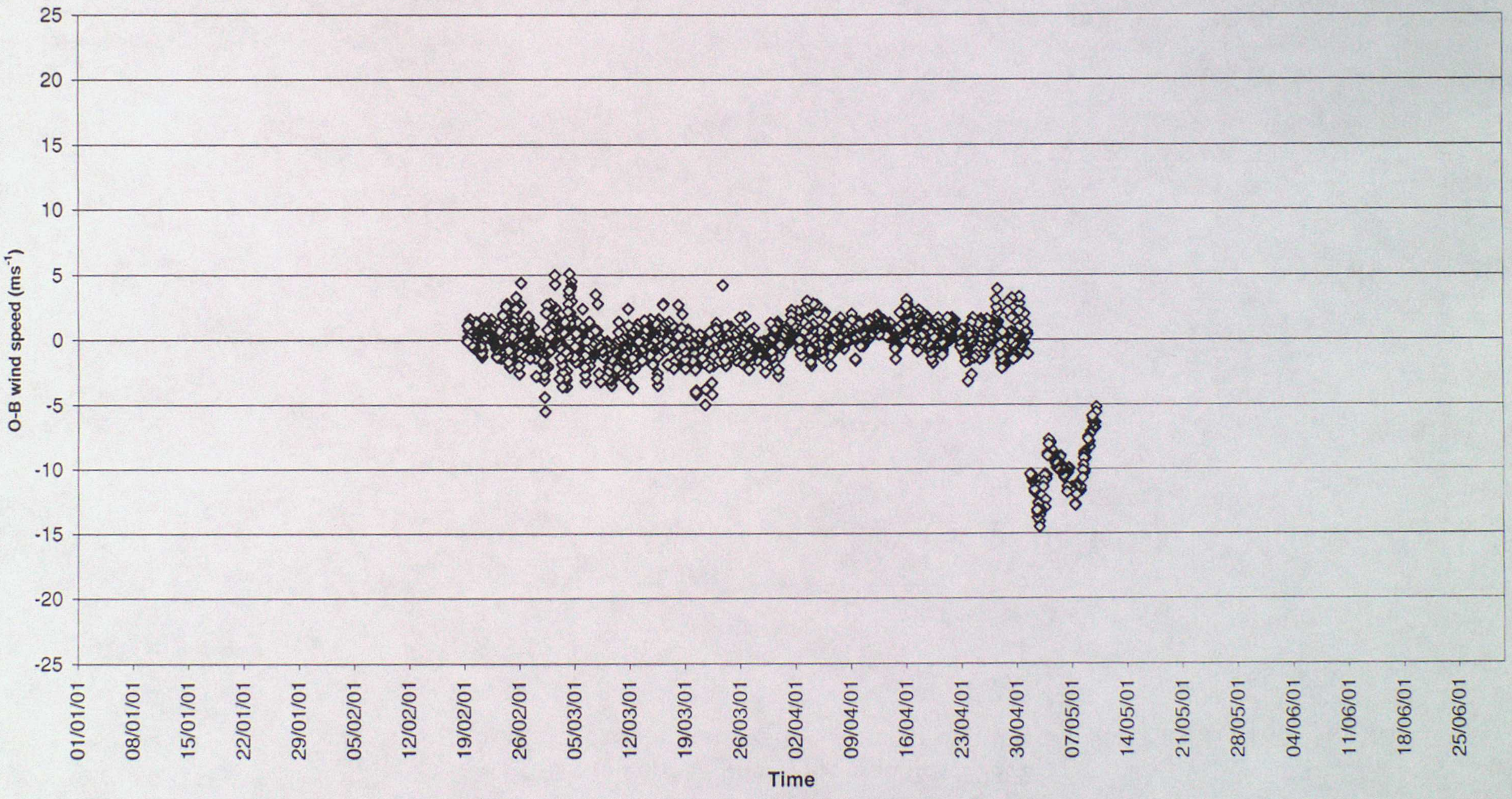


O-B wind speed (ms$^{-1}$) for identifier 52523
Number of obs. plotted = 472 Number of outliers = 0

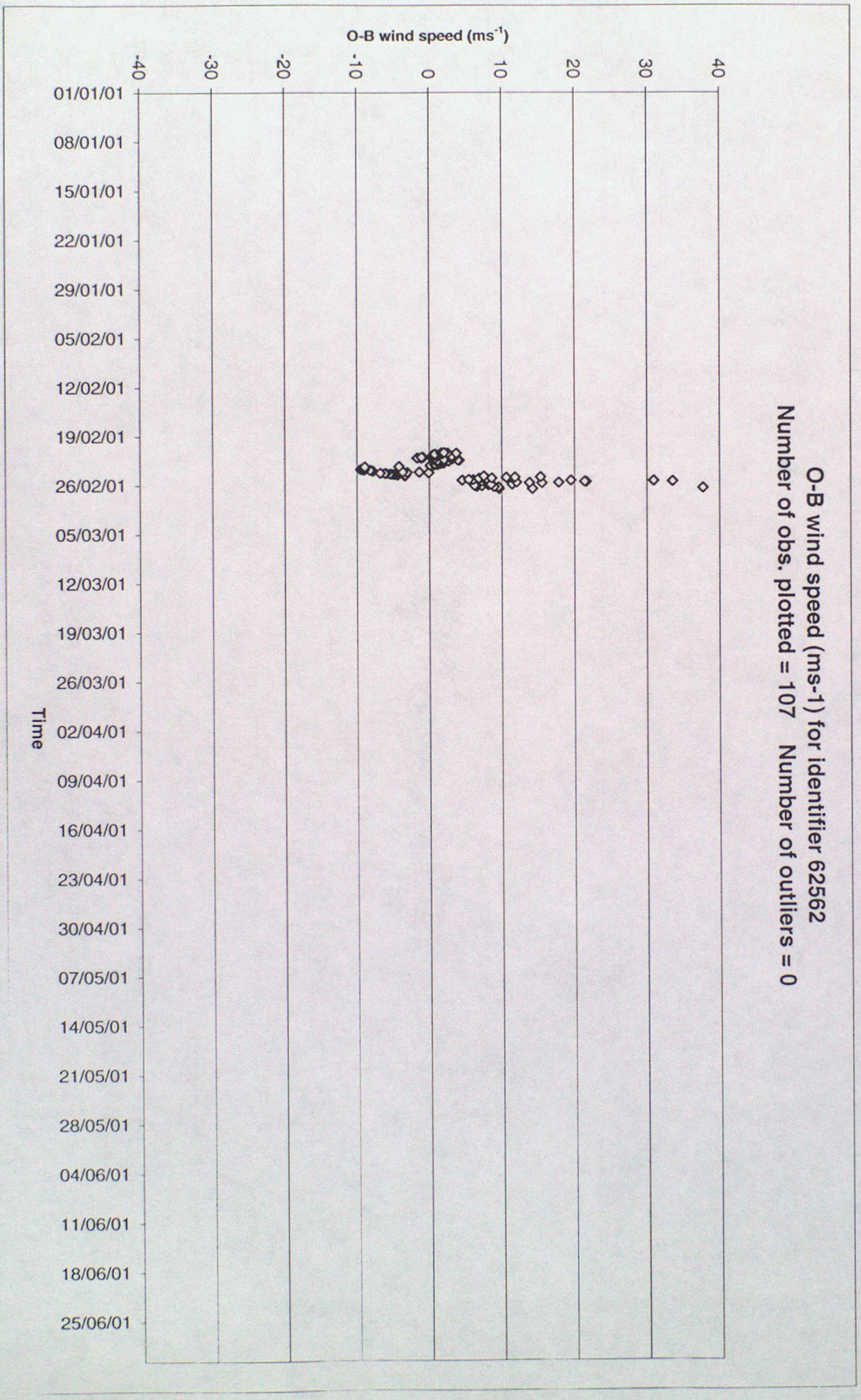


O-B wind speed ($ms^{-1}$) for identifier 62505
Number of obs. plotted = 251    Number of outliers = 0

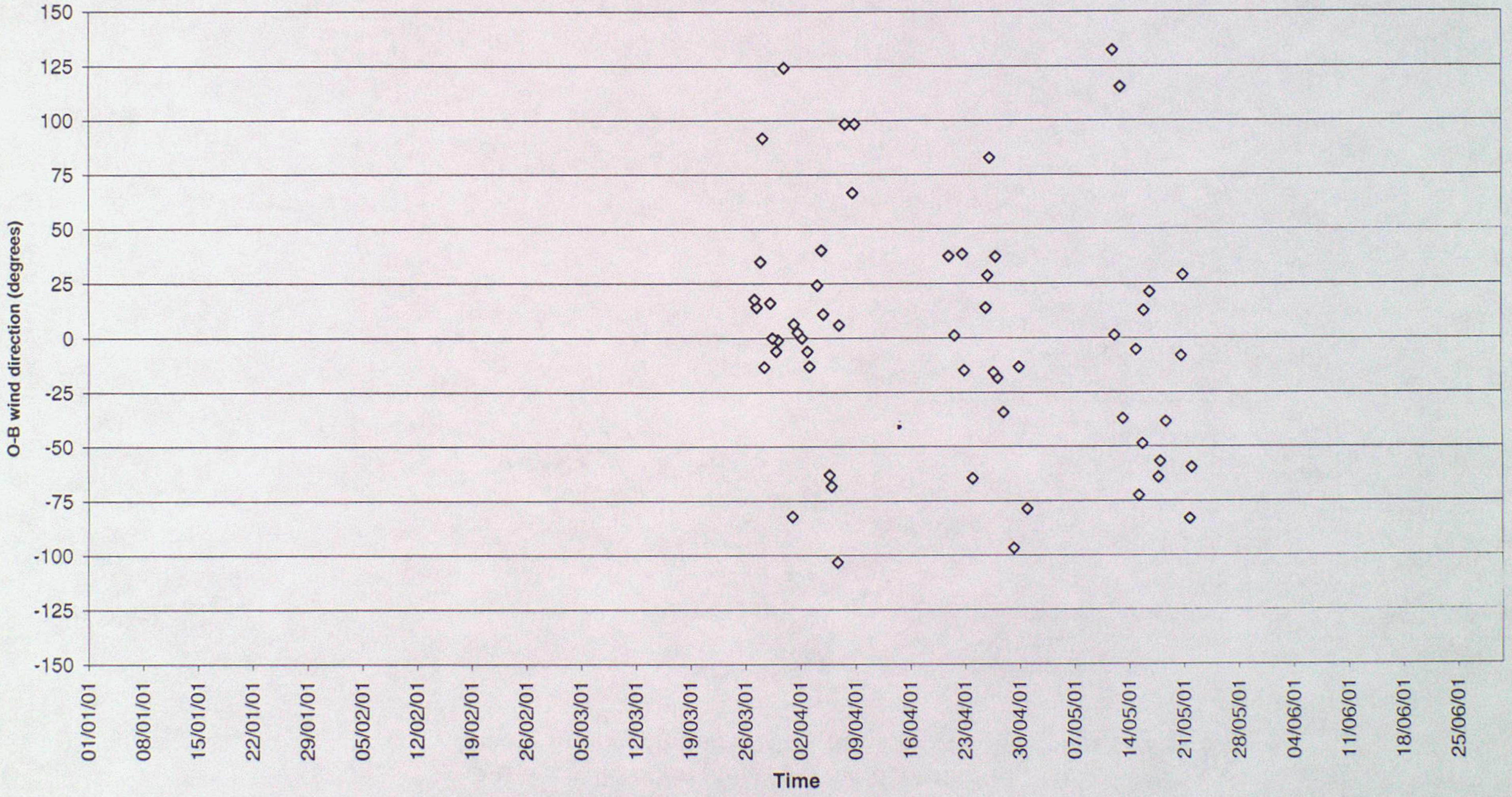




O-B wind speed (ms$^{-1}$) for identifier 62557
Number of obs. plotted = 1196    Number of outliers = 0

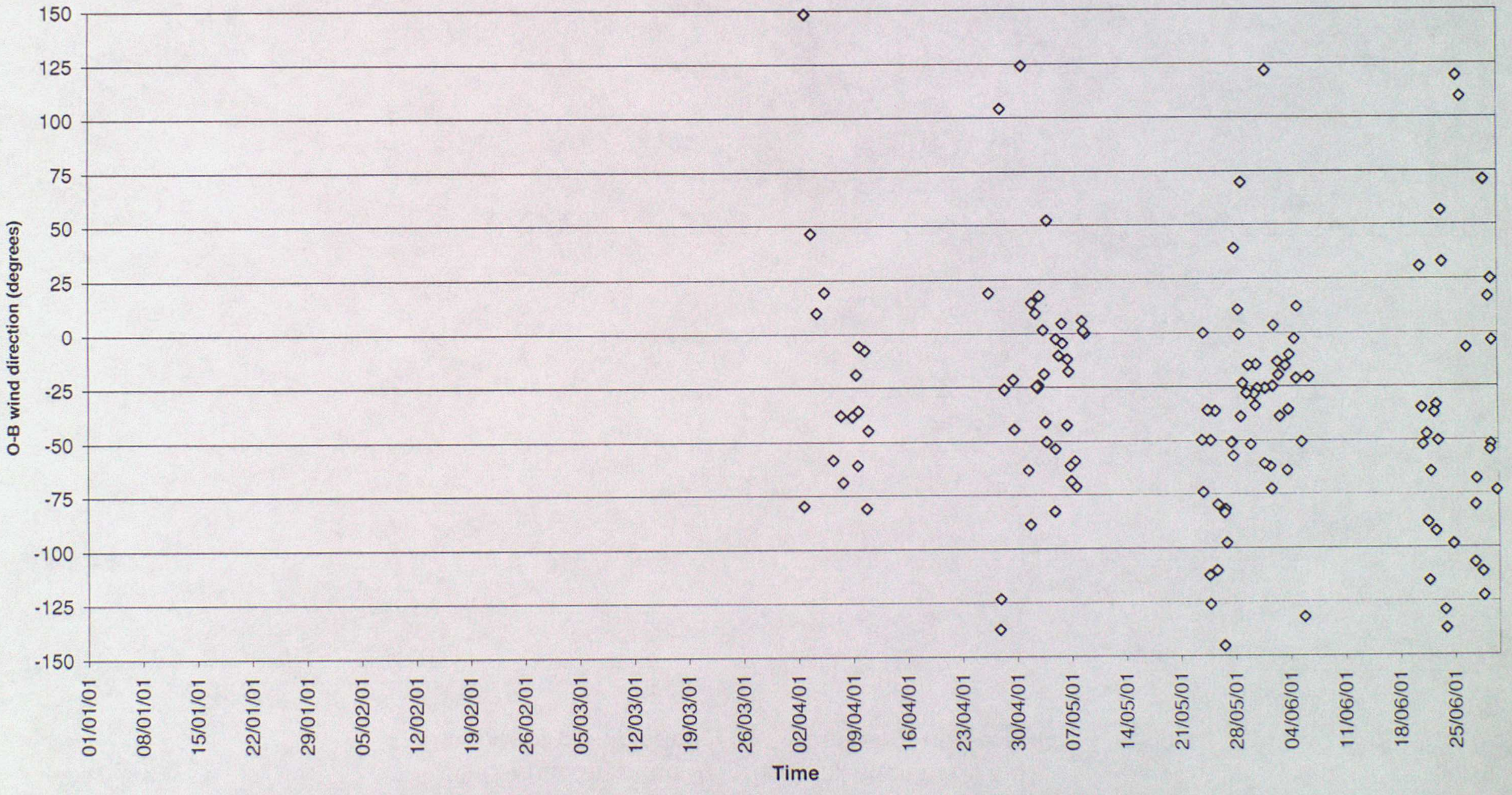


O-B wind speed (ms-1) for identifier 62562
Number of obs. plotted = 107 Number of outliers = 0

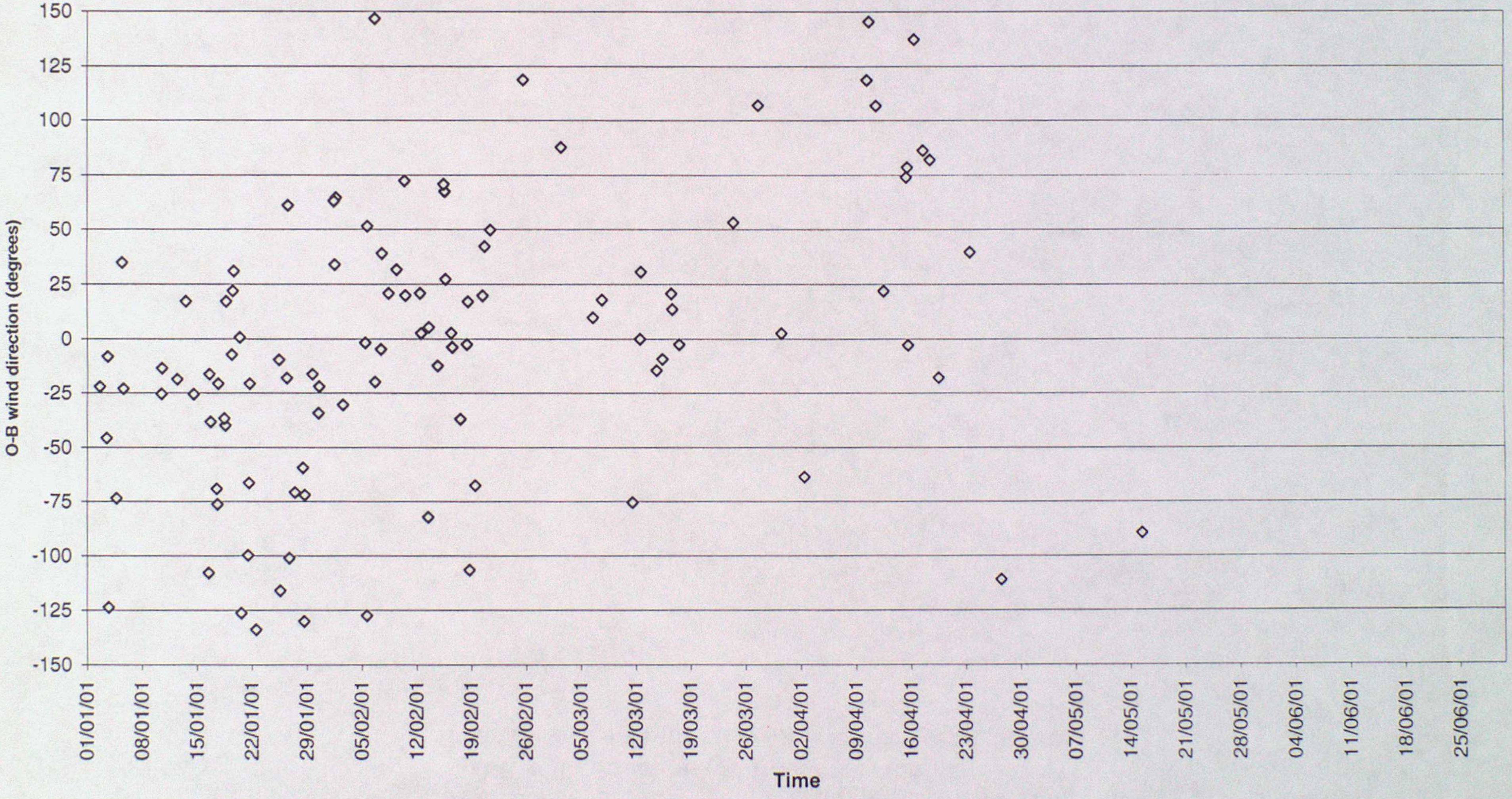


O-B wind direction (degrees) for identifier BKJI
Number of obs. plotted = 57    Number of outliers = 3

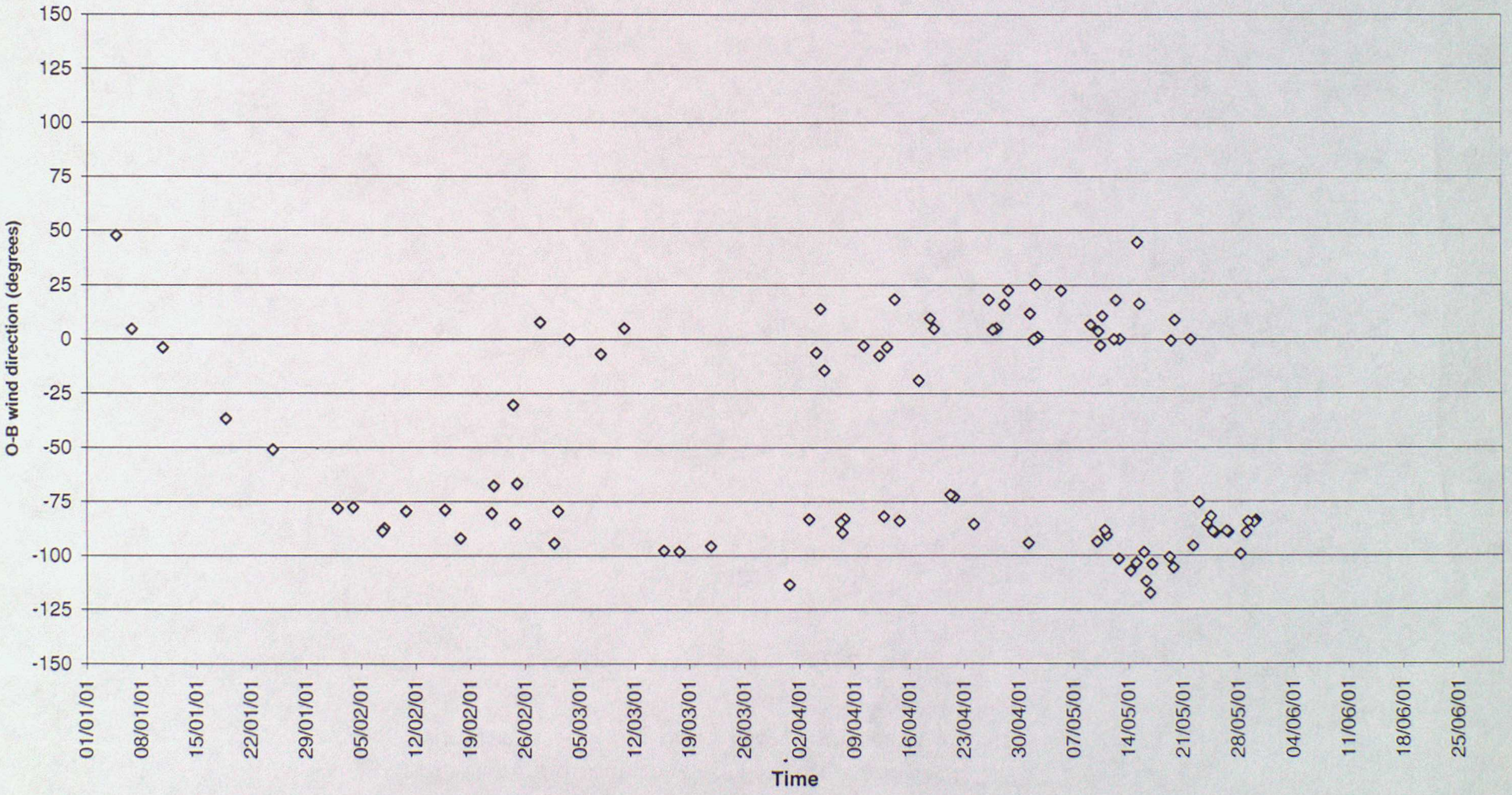
O-B wind direction (degrees) for identifier CG2248
Number of obs. plotted = 134    Number of outliers = 5



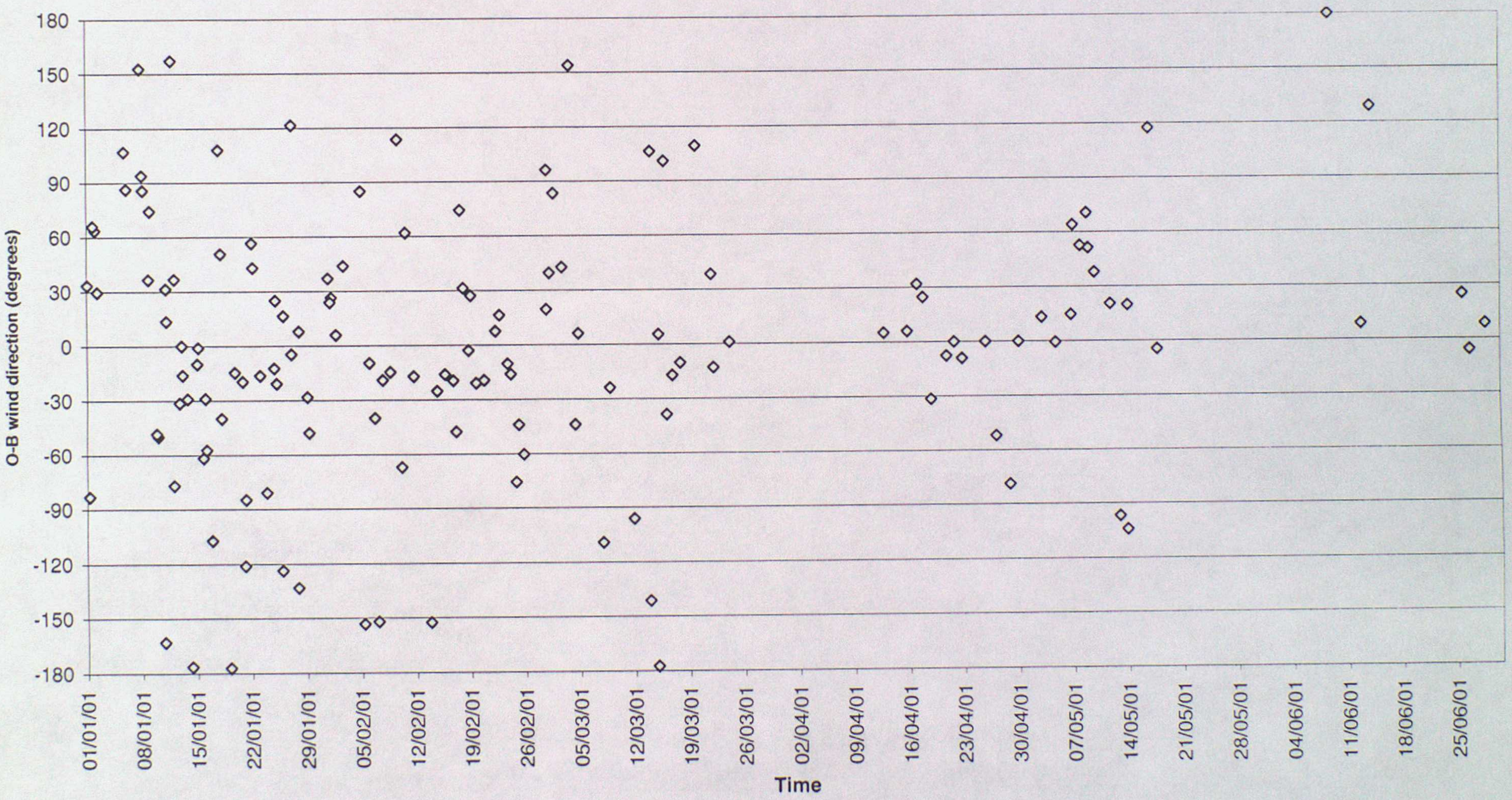
O-B wind direction (degrees) for identifier CG2260
Number of obs. plotted = 105    Number of outliers = 3



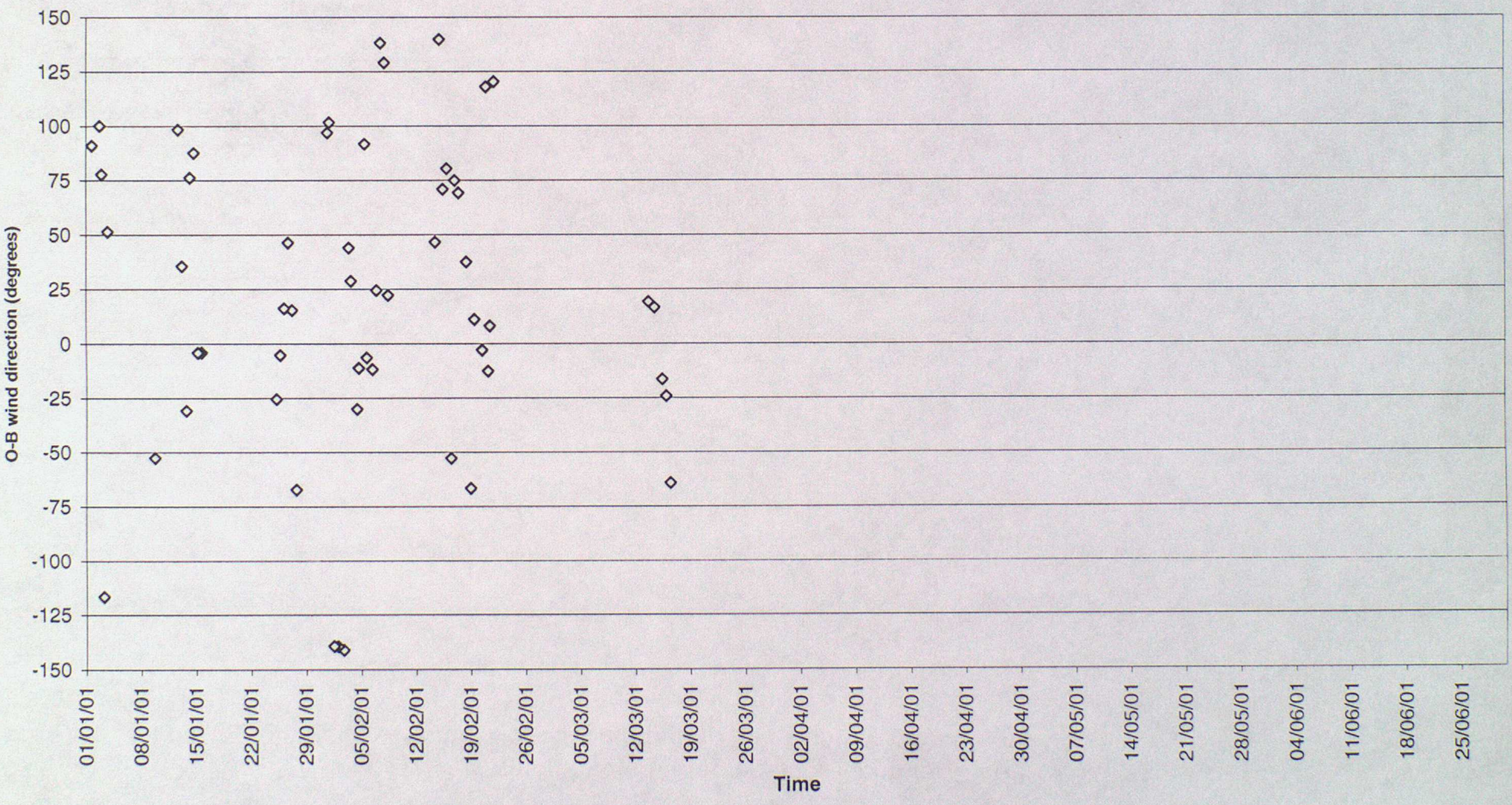
O-B wind direction (degrees) for identifier C6FN4
Number of obs. plotted = 94    Number of outliers = 1



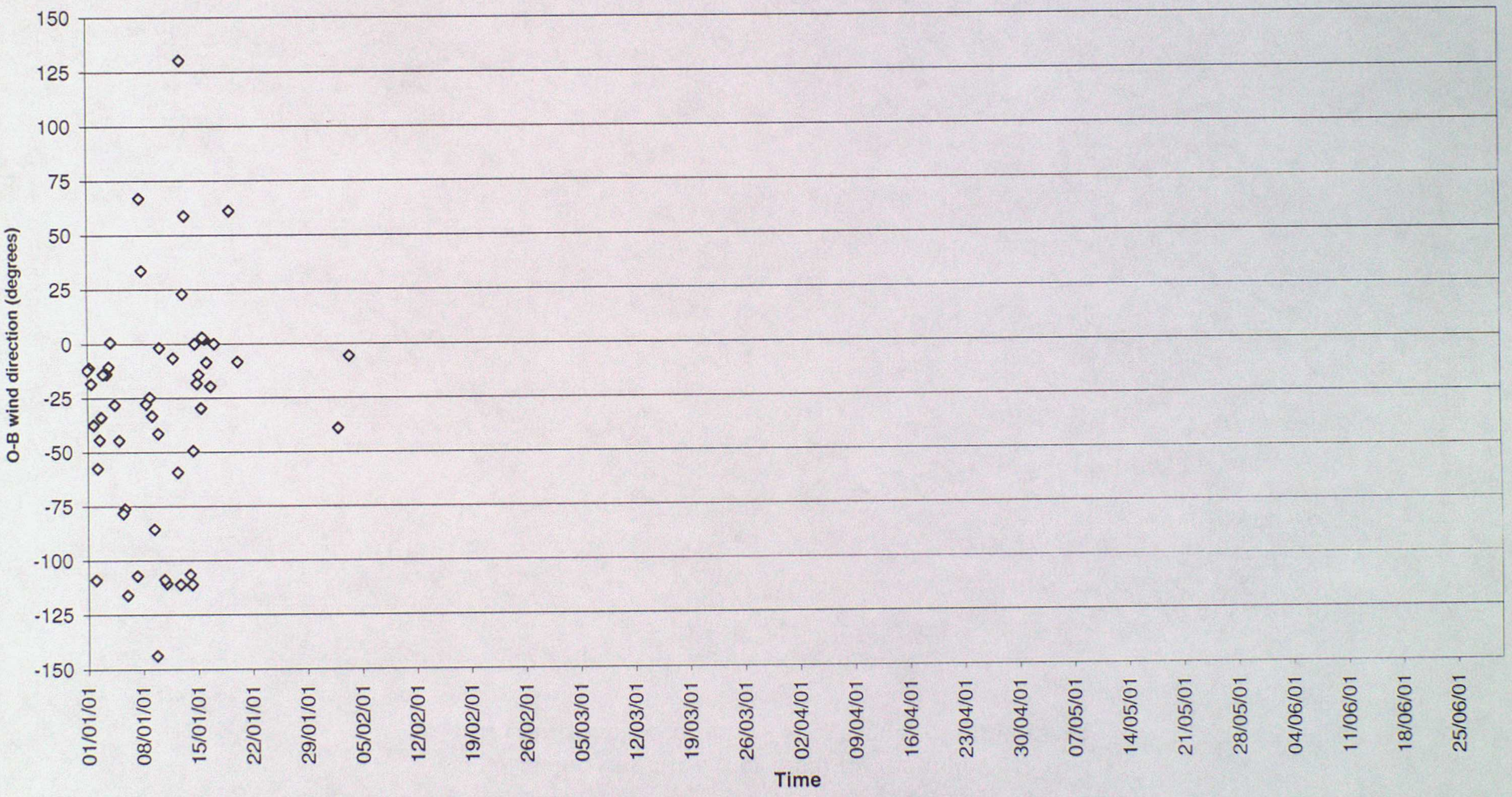
O-B wind direction (degrees) for identifier C6IU4
Number of obs. plotted = 144    Number of outliers = 0

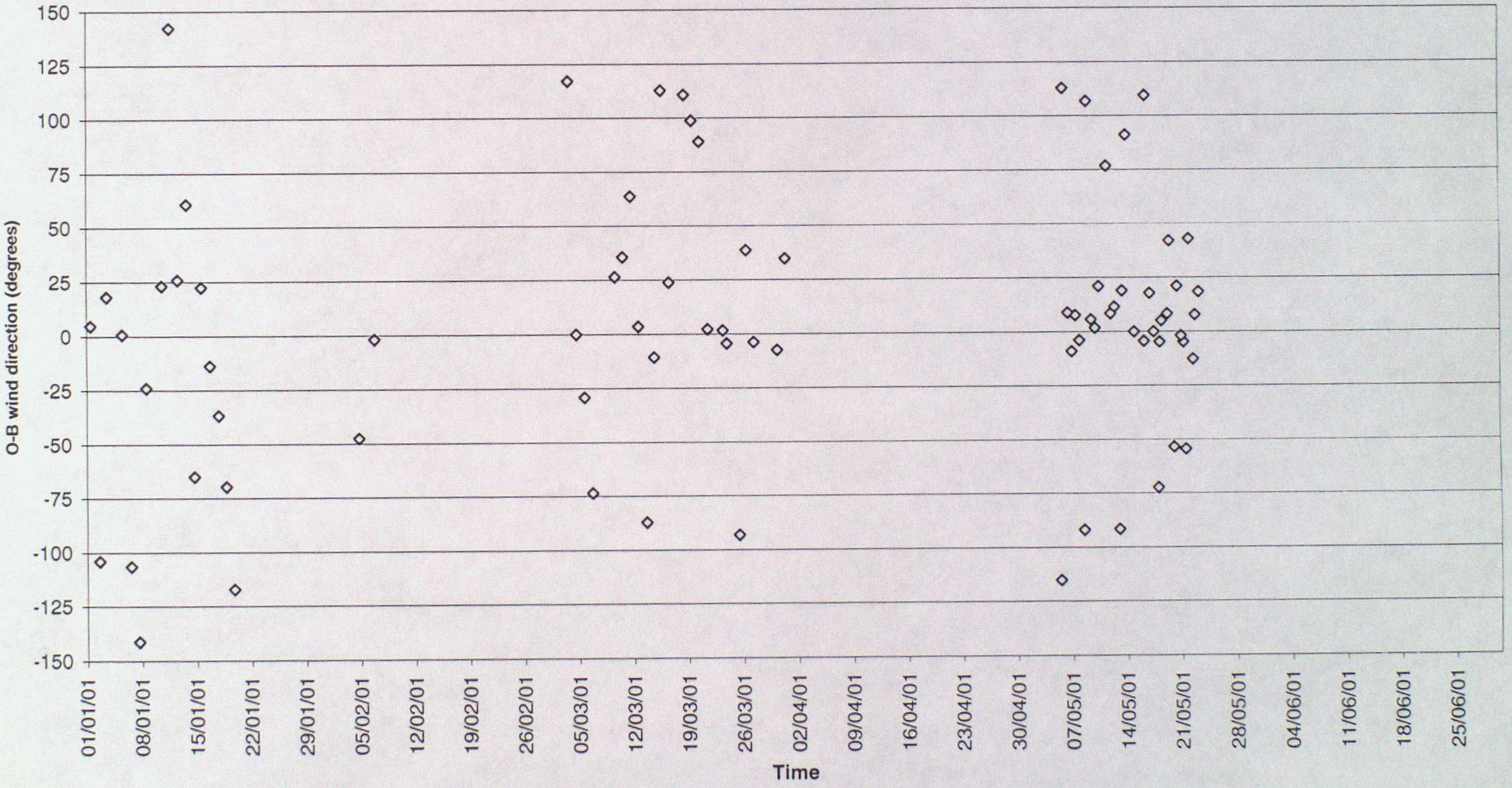


## O-B wind direction (degrees) for identifier C6OT7
Number of obs. plotted = 55    Number of outliers = 5

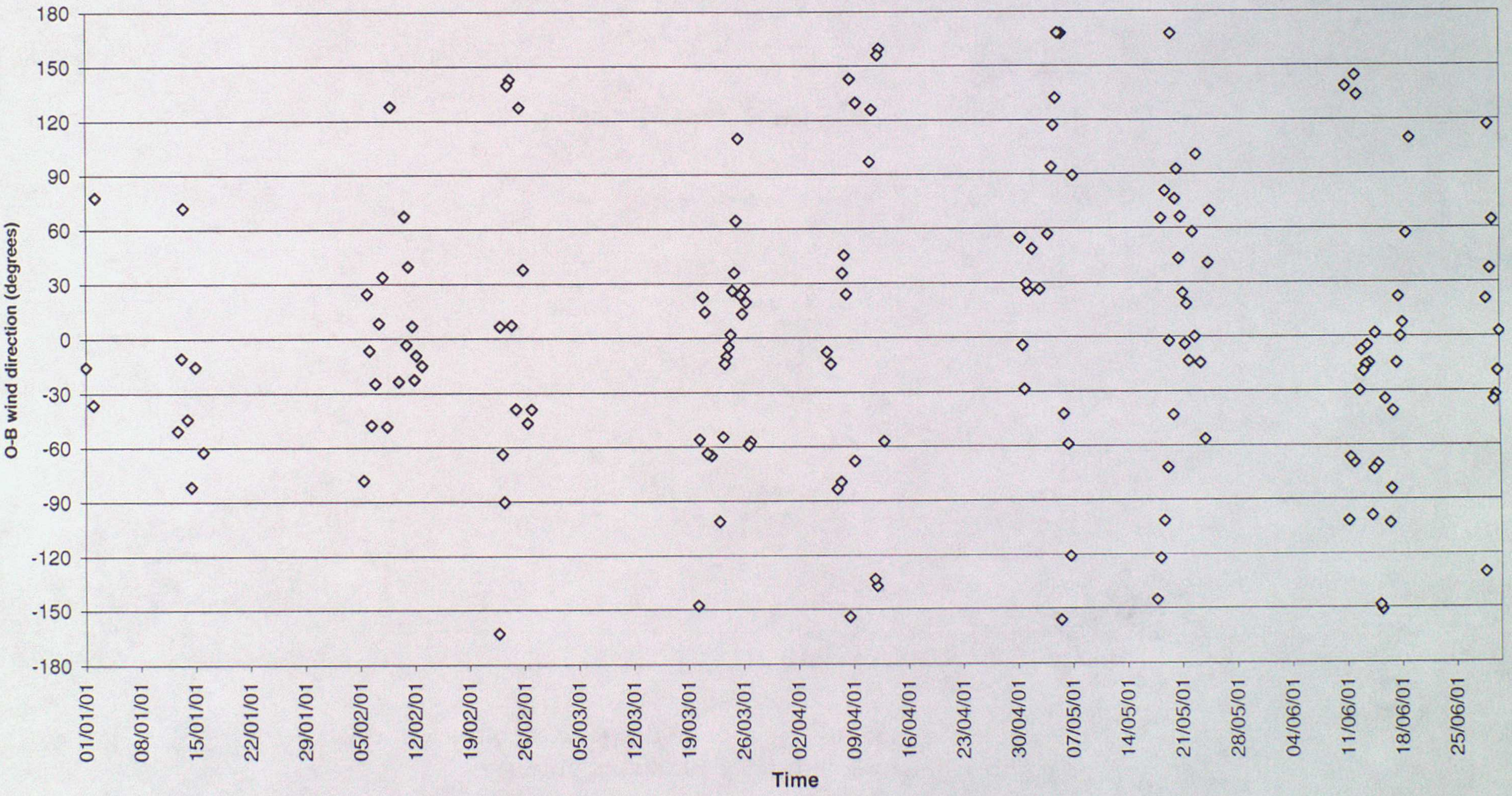


O-B wind direction (degrees) for identifier DJPL
Number of obs. plotted = 51    Number of outliers = 6

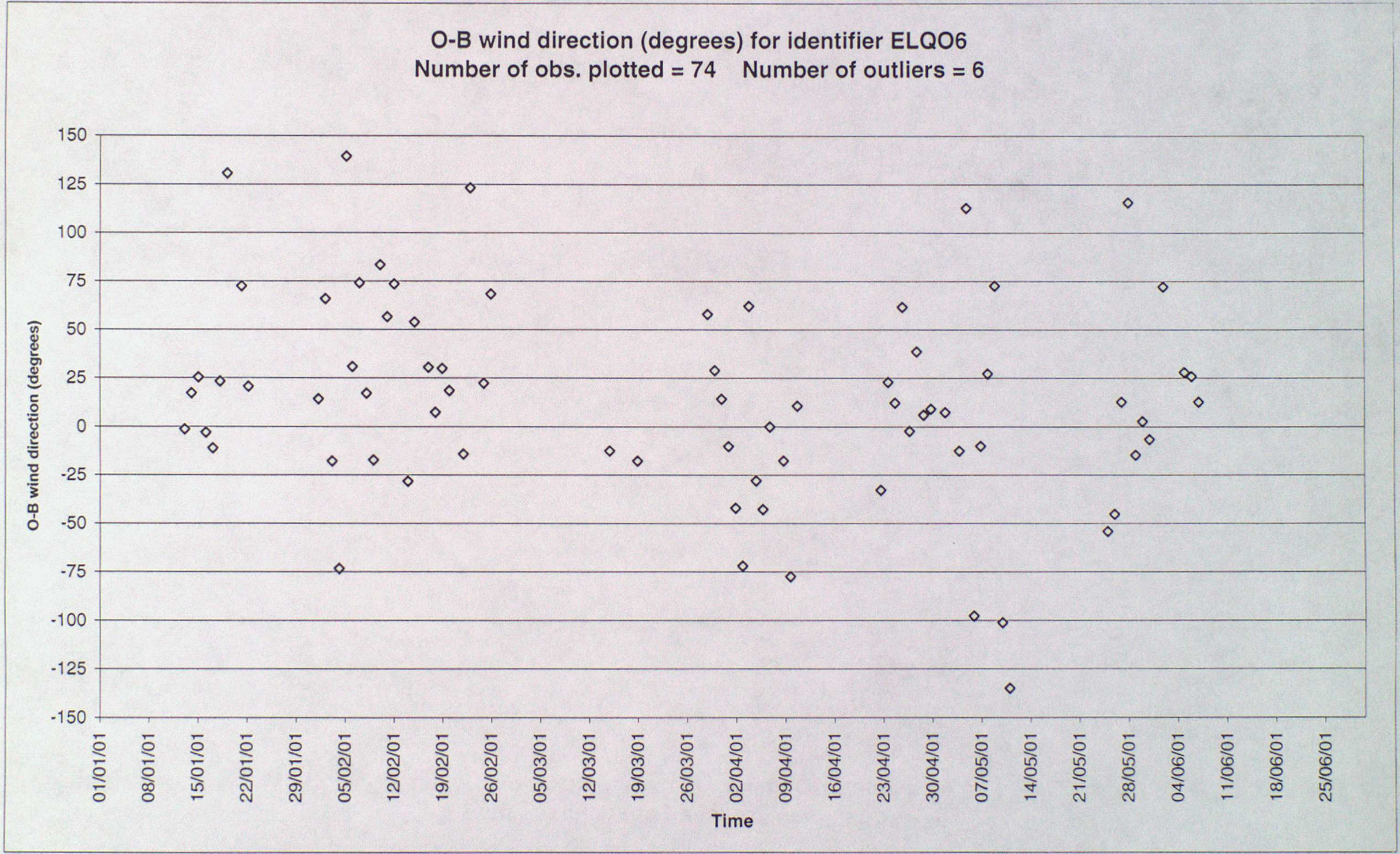




O-B wind direction (degrees) for identifier DUGZ
Number of obs. plotted = 78    Number of outliers = 5

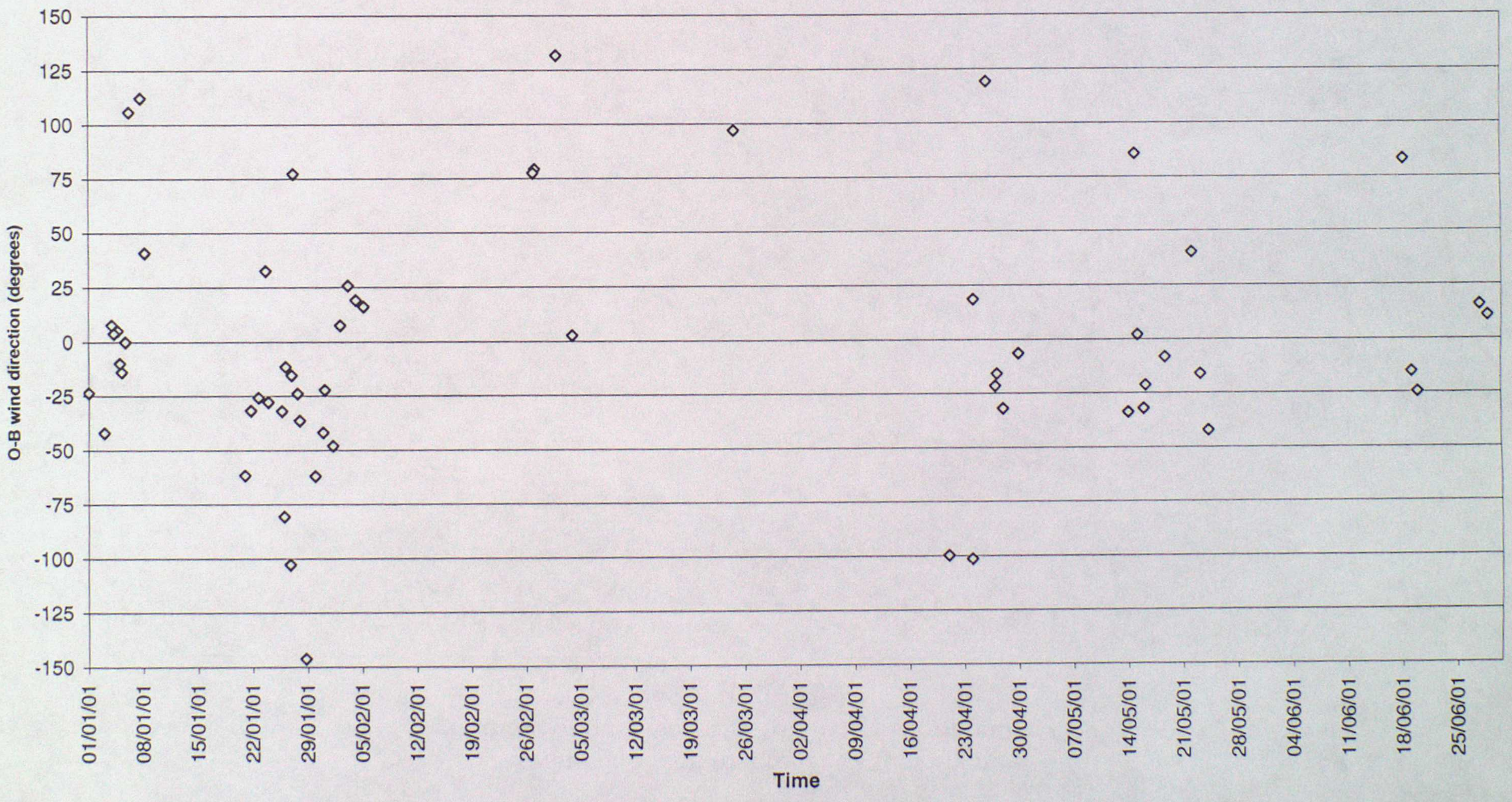


O-B wind direction (degrees) for identifier ELOT3
Number of obs. plotted = 158    Number of outliers = 0

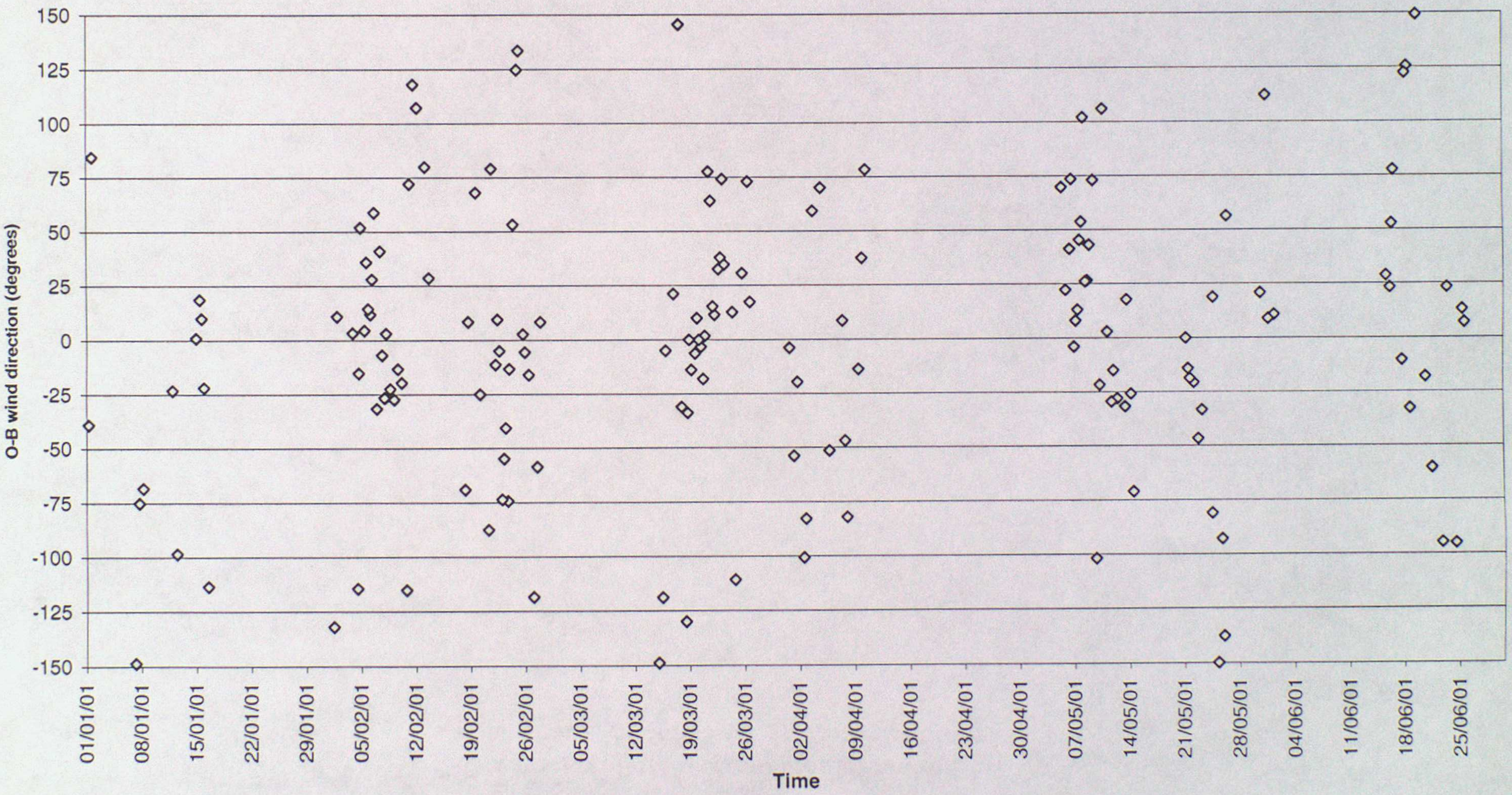


O-B wind direction (degrees) for identifier ELQO6
Number of obs. plotted = 74    Number of outliers = 6

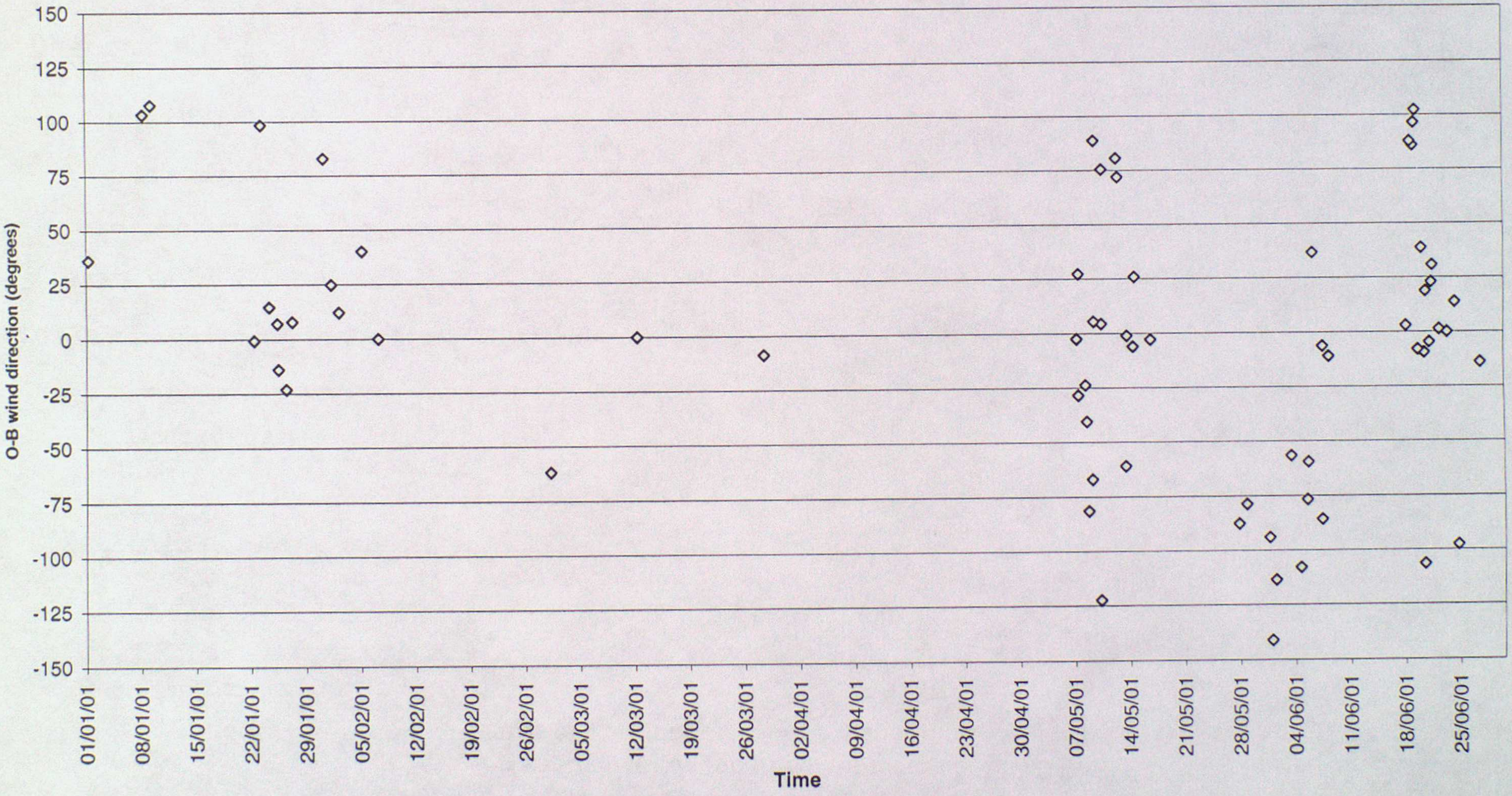
O-B wind direction (degrees) for identifier ELRY5
Number of obs. plotted = 60    Number of outliers = 3



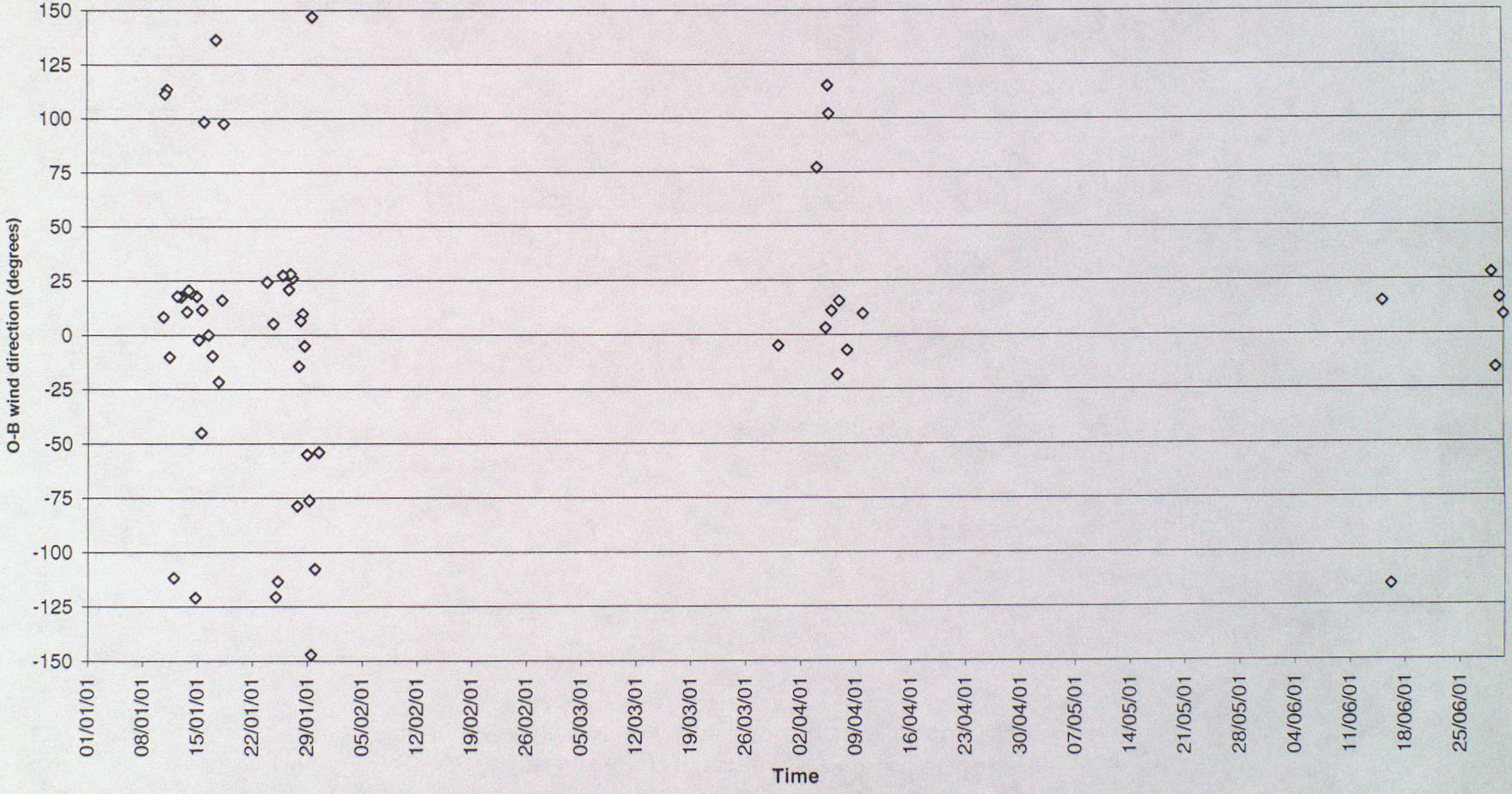
O-B wind direction (degrees) for identifier ELVS2
Number of obs. plotted = 162    Number of outliers = 7



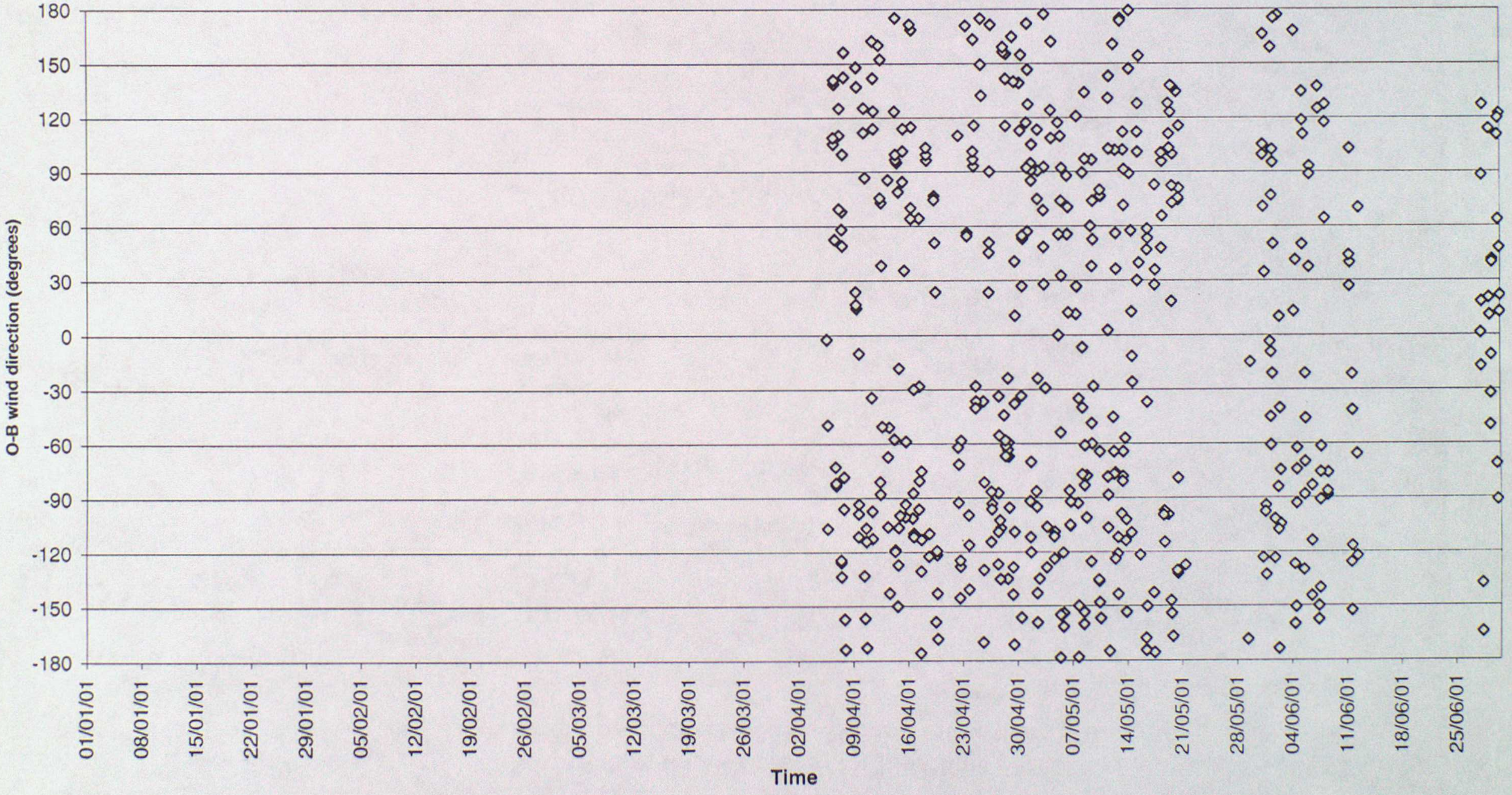
O-B wind direction (degrees) for identifier ELWR8
Number of obs. plotted = 68    Number of outliers = 2



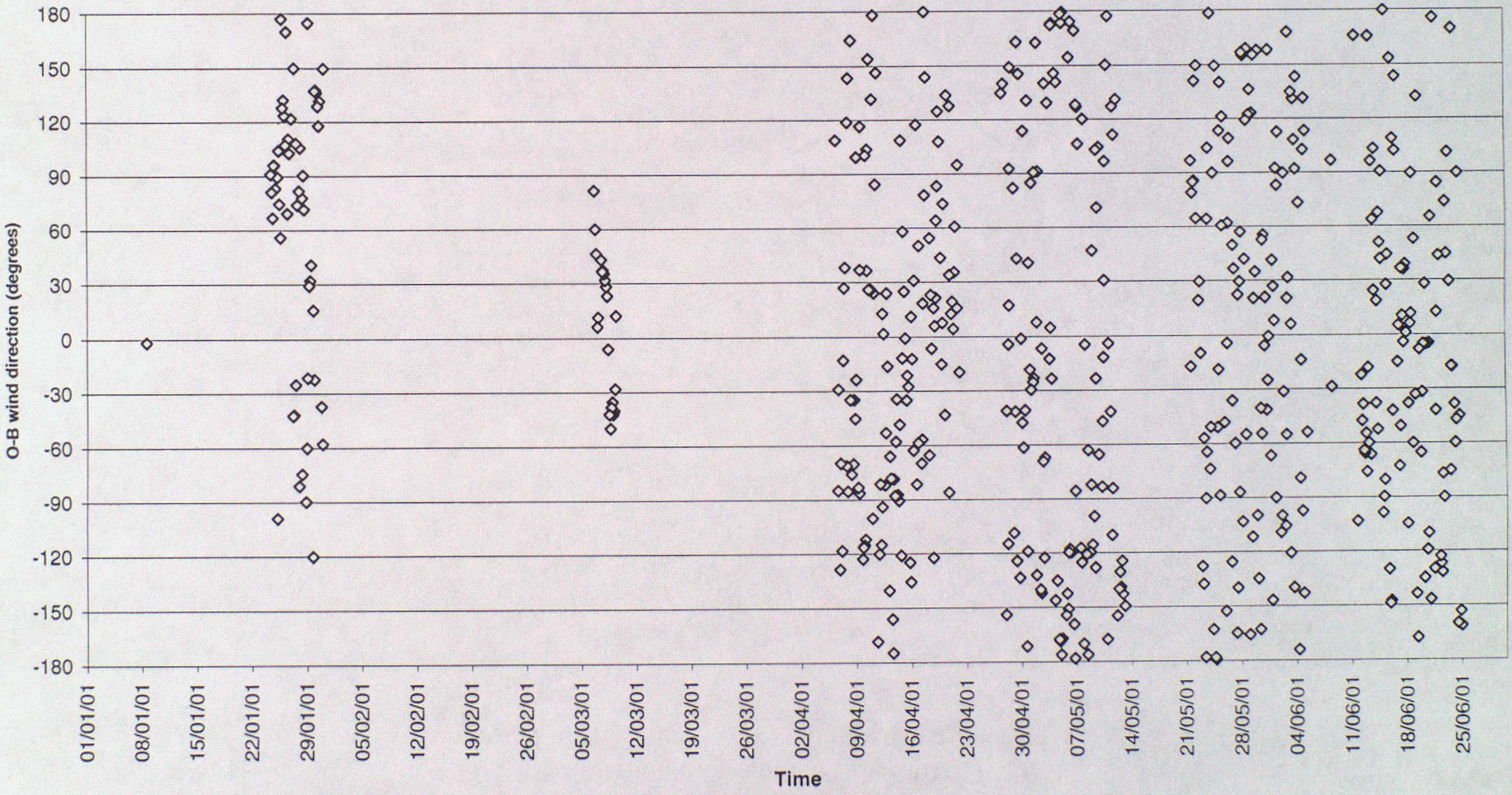
O-B wind direction (degrees) for identifier ELYD4
Number of obs. plotted = 57 Number of outliers = 2

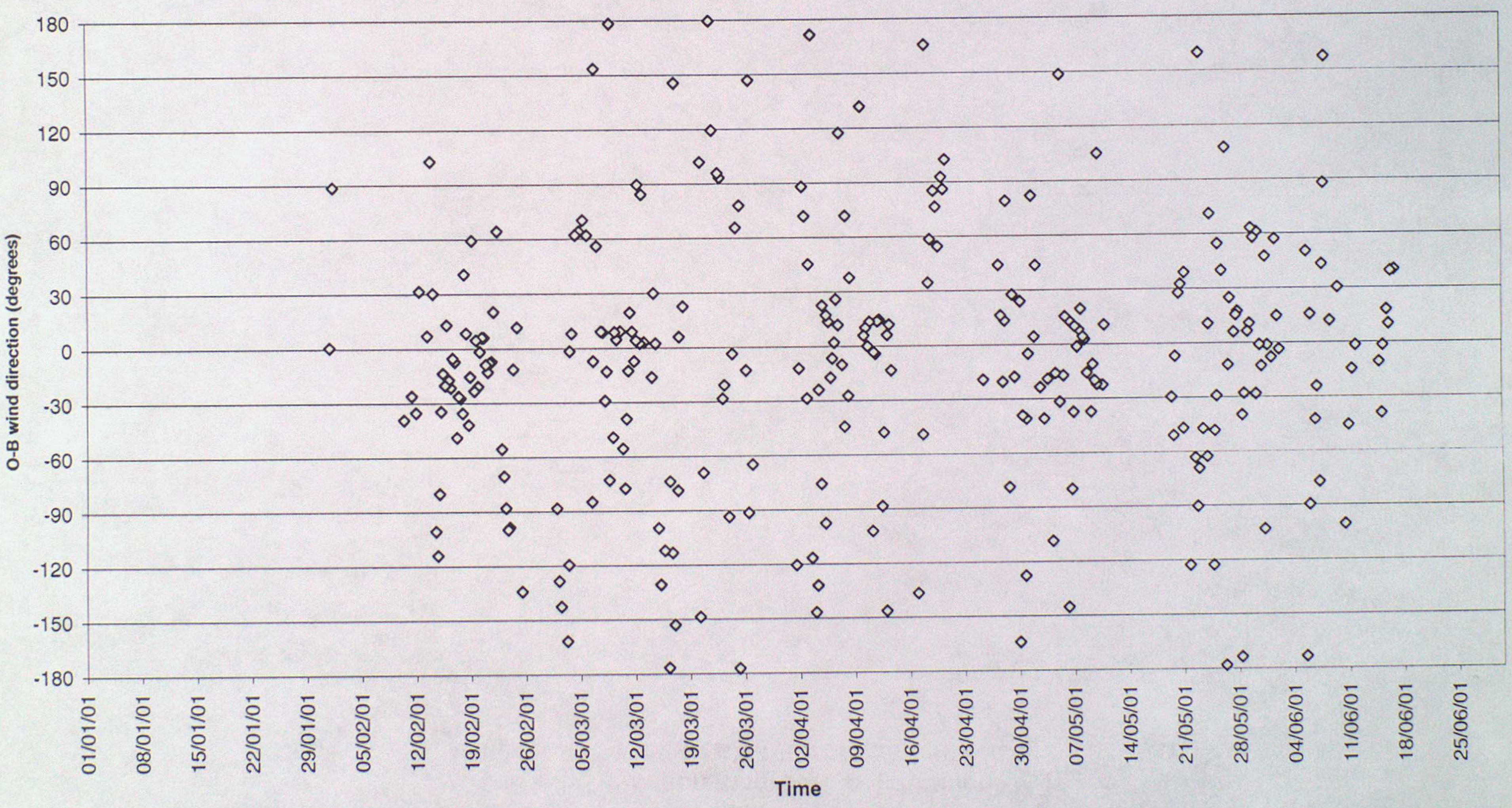


O-B wind direction (degrees) for identifier FKWK
Number of obs. plotted = 492    Number of outliers = 0

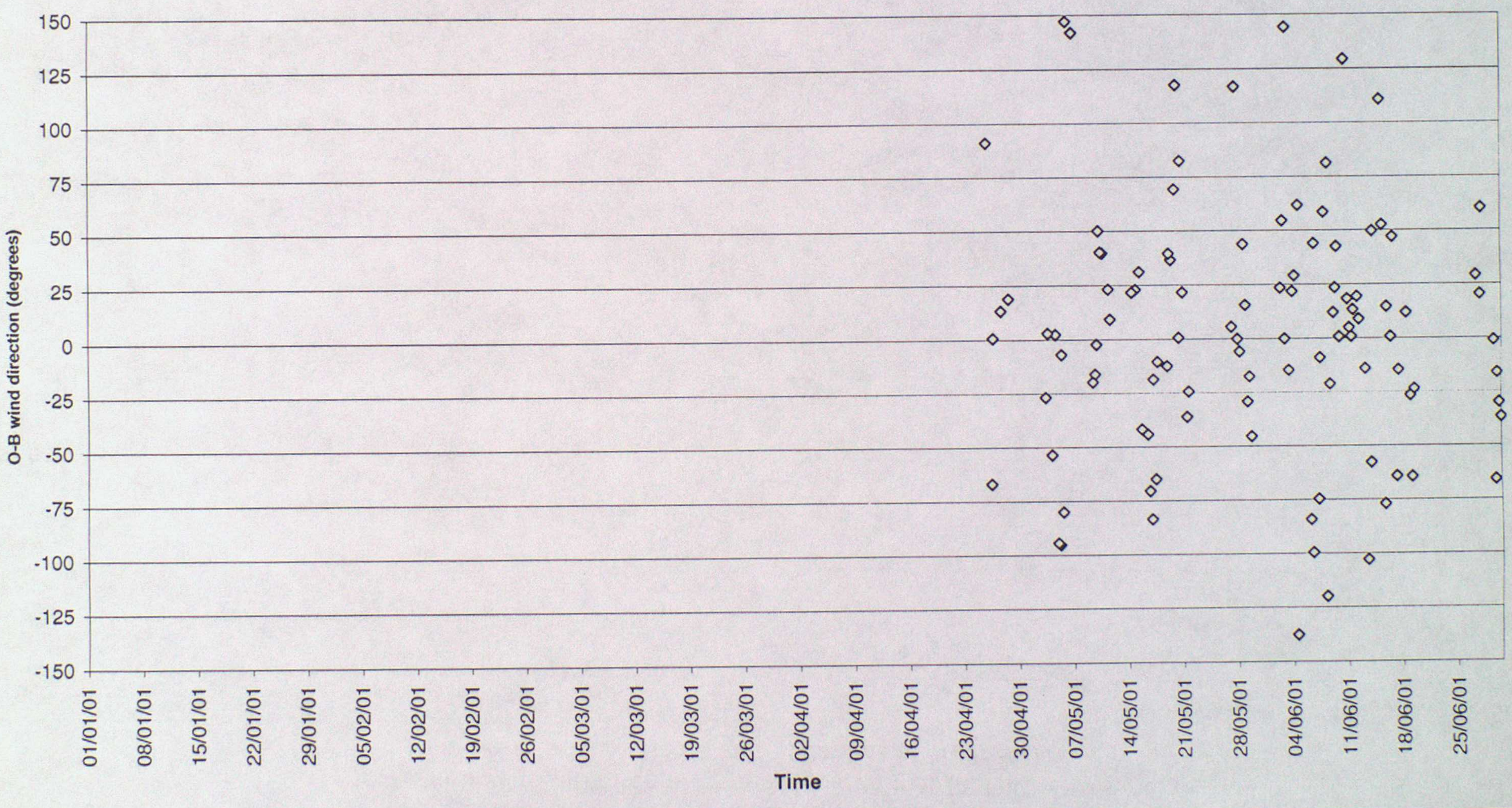


O-B wind direction (degrees) for identifier FPSS
Number of obs. plotted = 525    Number of outliers = 0



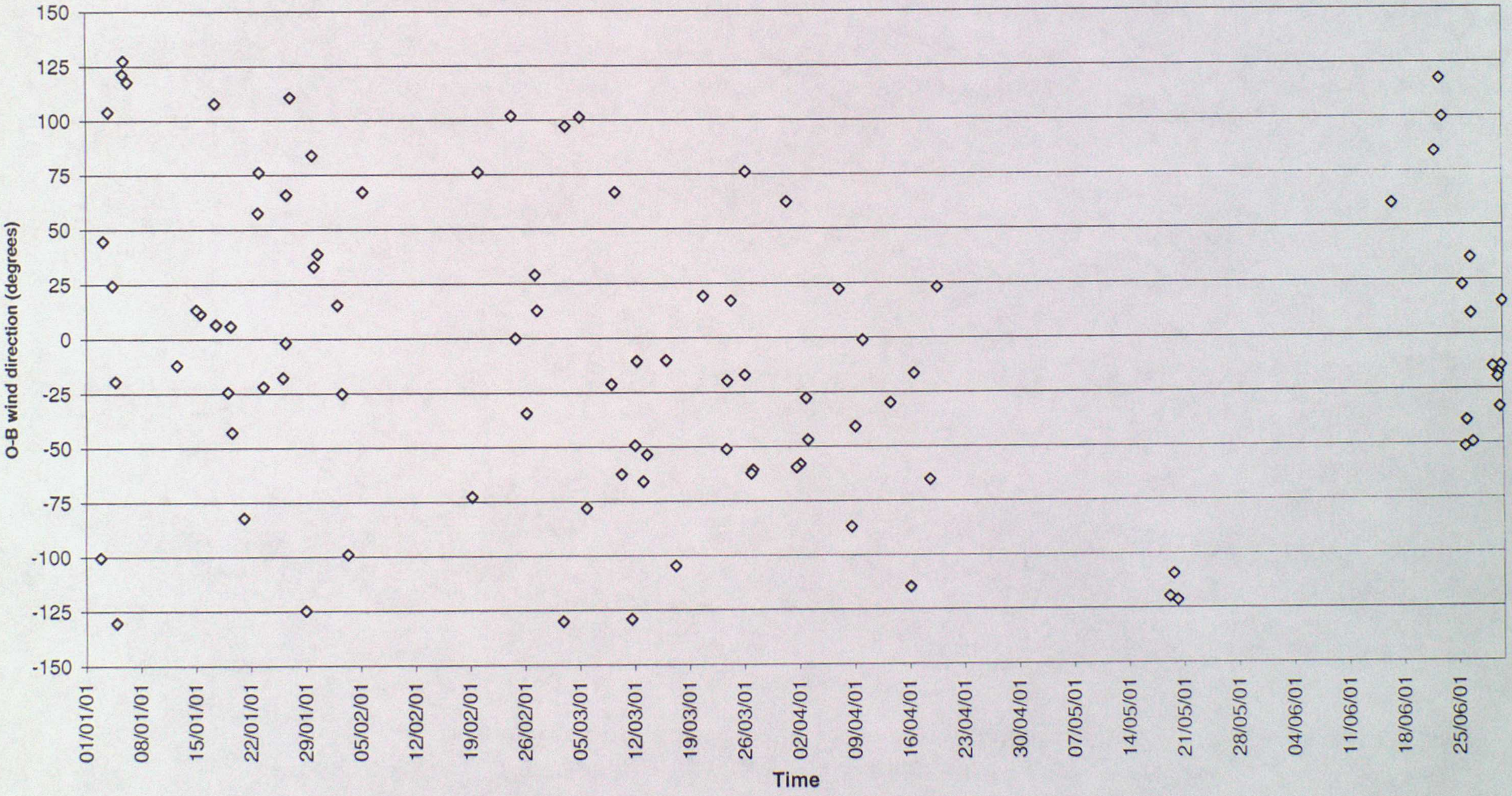


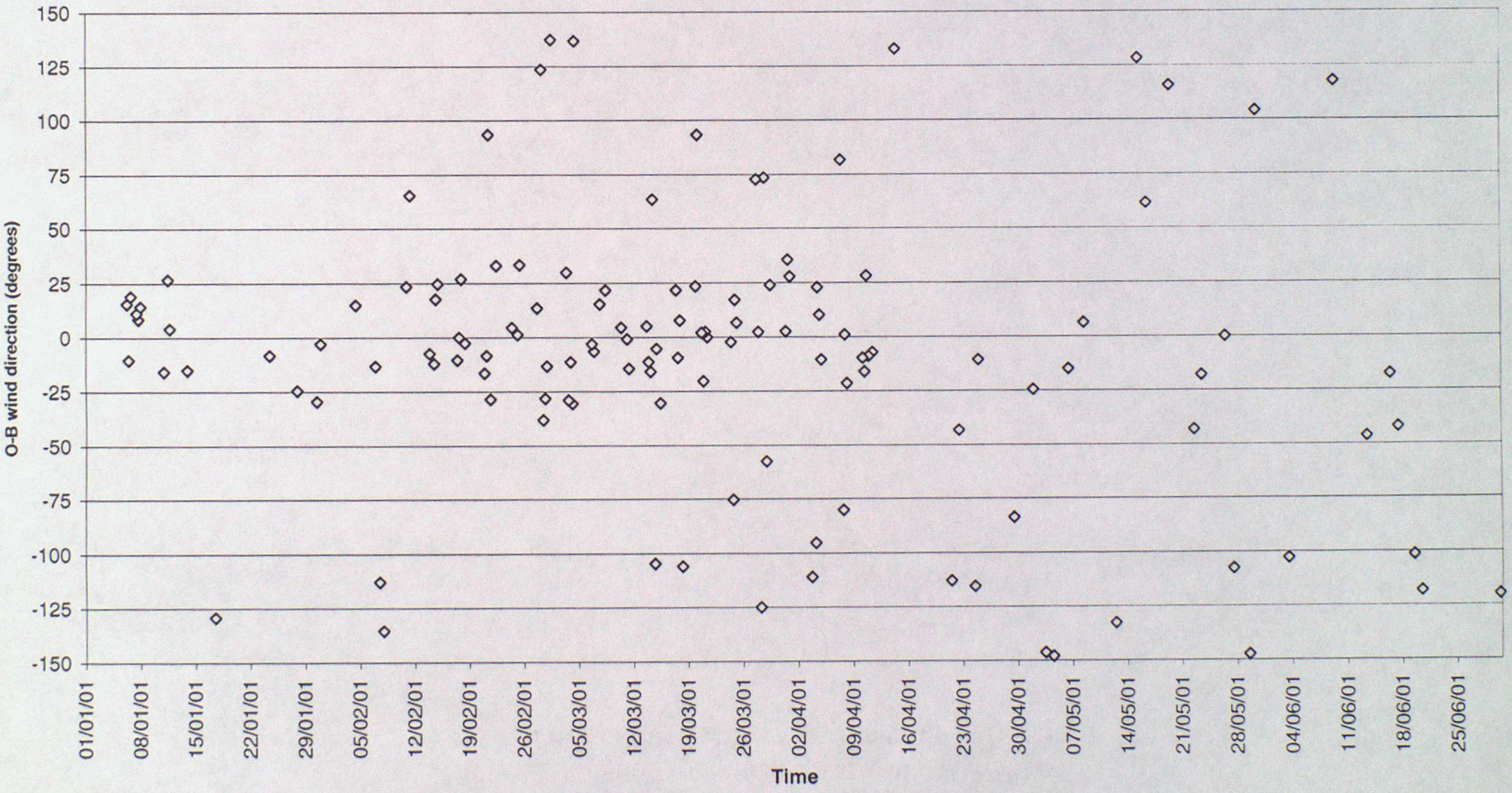
O-B wind direction (degrees) for identifier MSQK3
Number of obs. plotted = 286    Number of outliers = 0

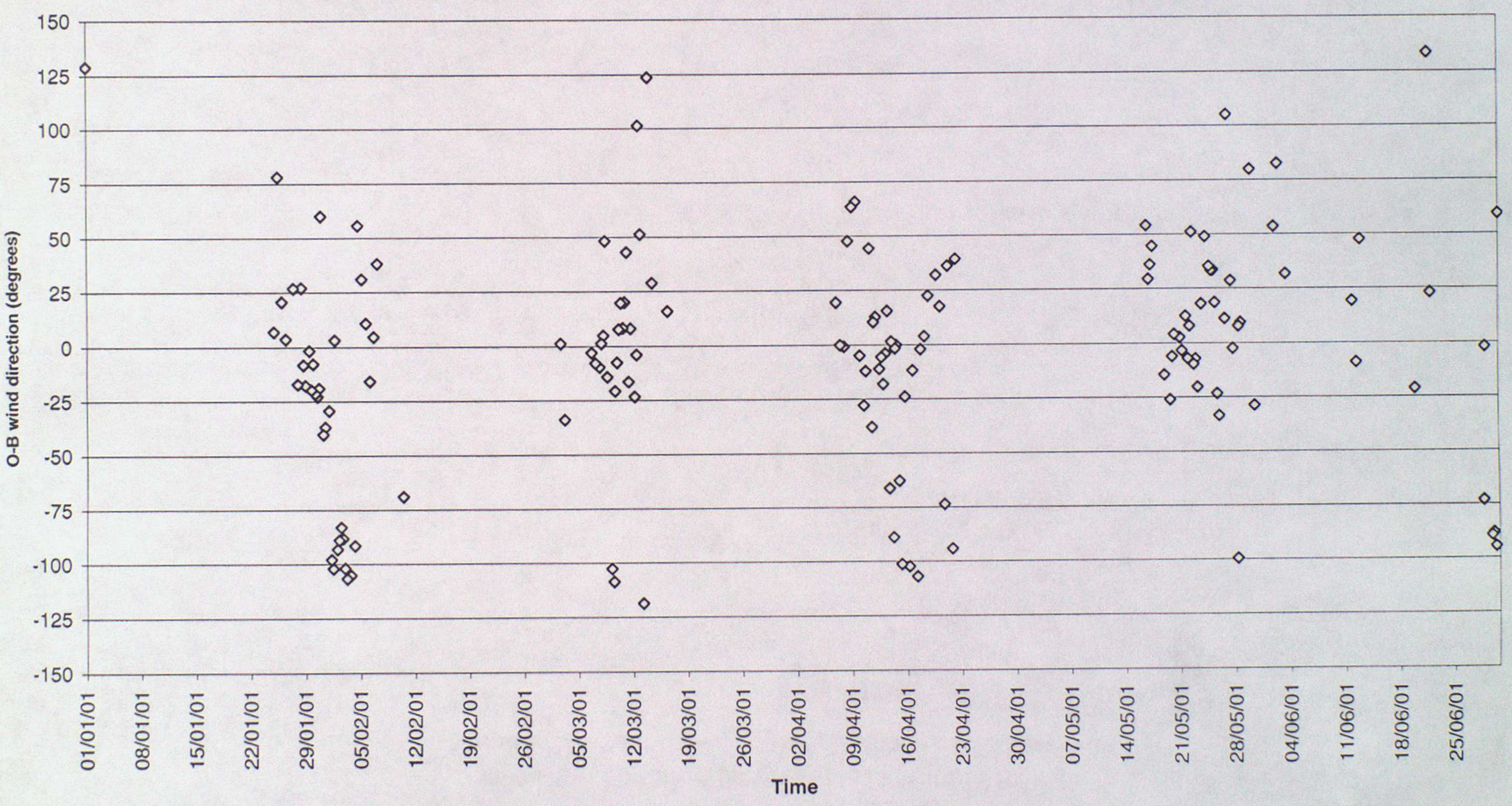


O-B wind direction (degrees) for identifier NMRY
Number of obs. plotted = 105    Number of outliers = 8

O-B wind direction (degrees) for identifier OWDD
Number of obs. plotted = 95    Number of outliers = 4

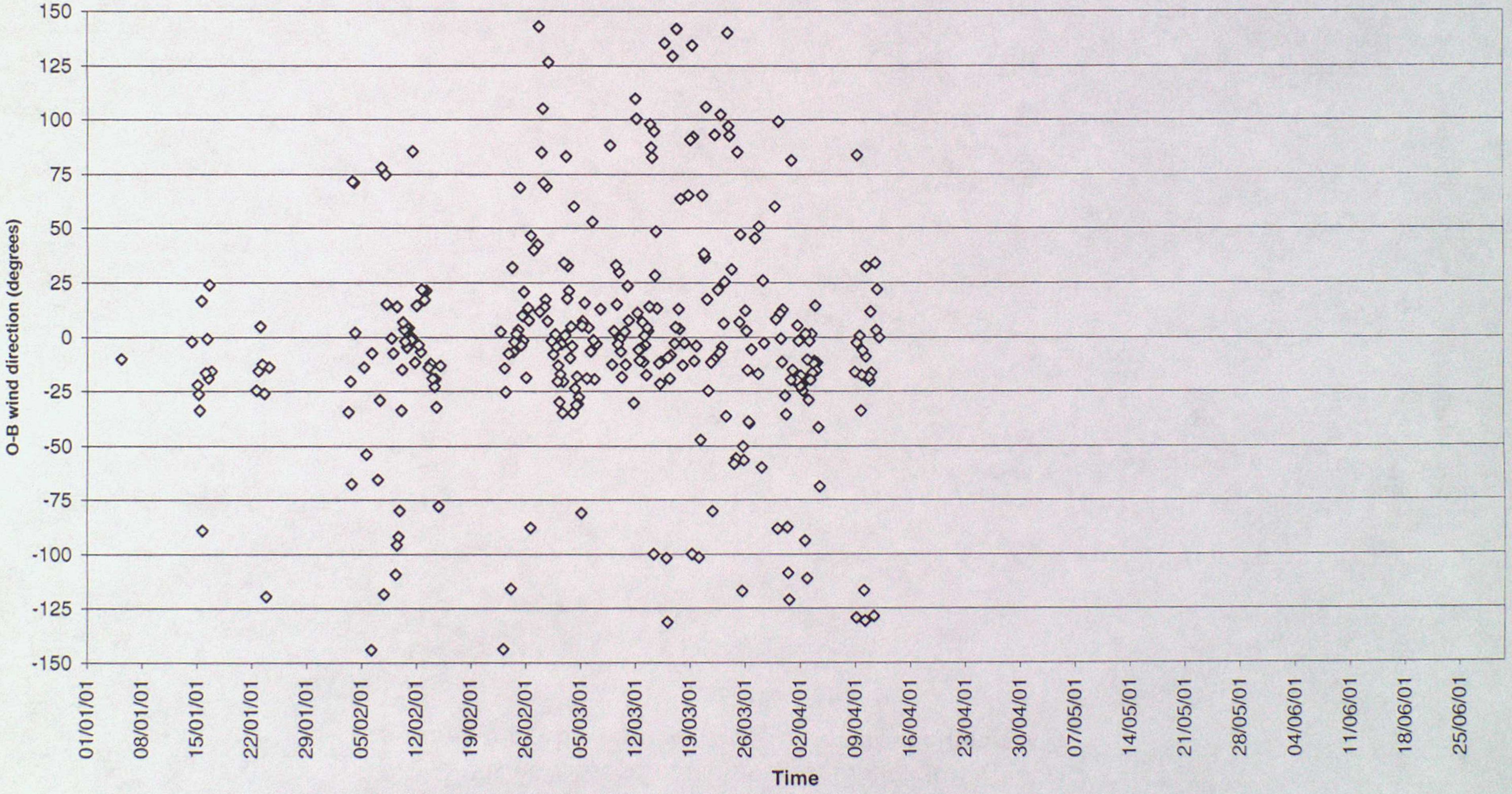



O-B wind direction (degrees) for identifier PJJU
Number of obs. plotted = 128    Number of outliers = 7

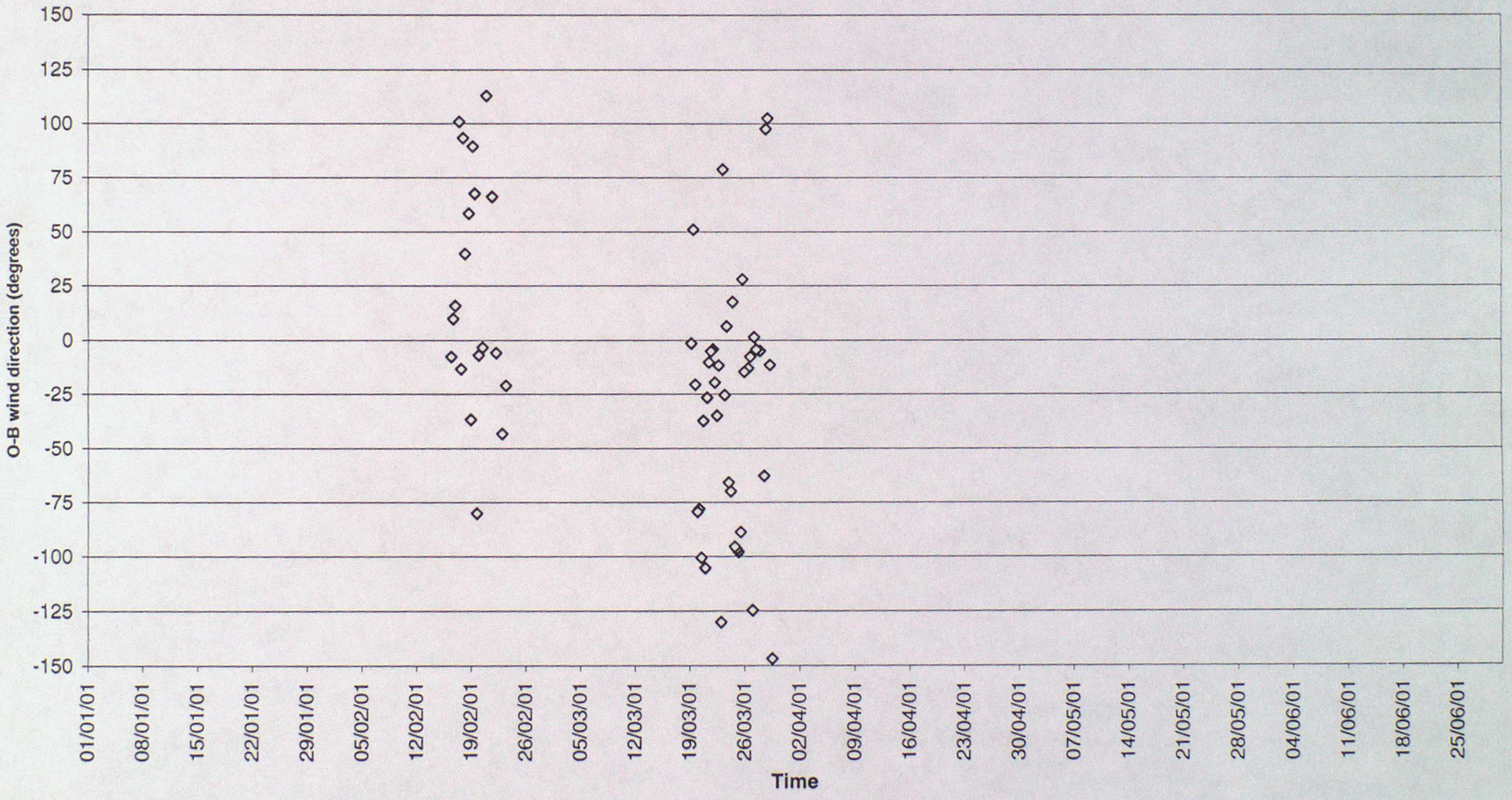


O-B wind direction (degrees) for identifier P3RF8
Number of obs. plotted = 153 Number of outliers = 8

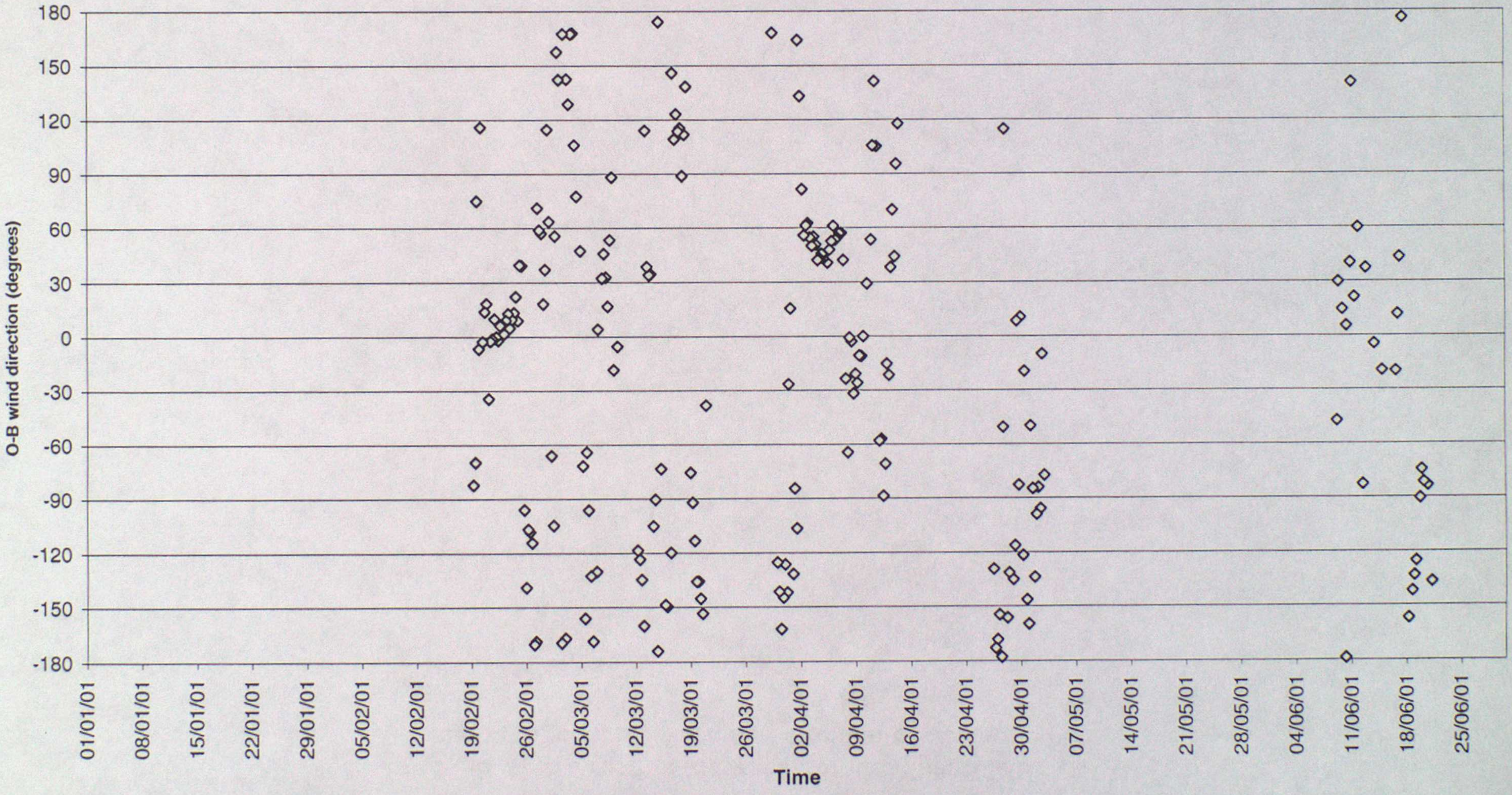
O-B wind direction (degrees) for identifier SBPR
Number of obs. plotted = 306    Number of outliers = 5



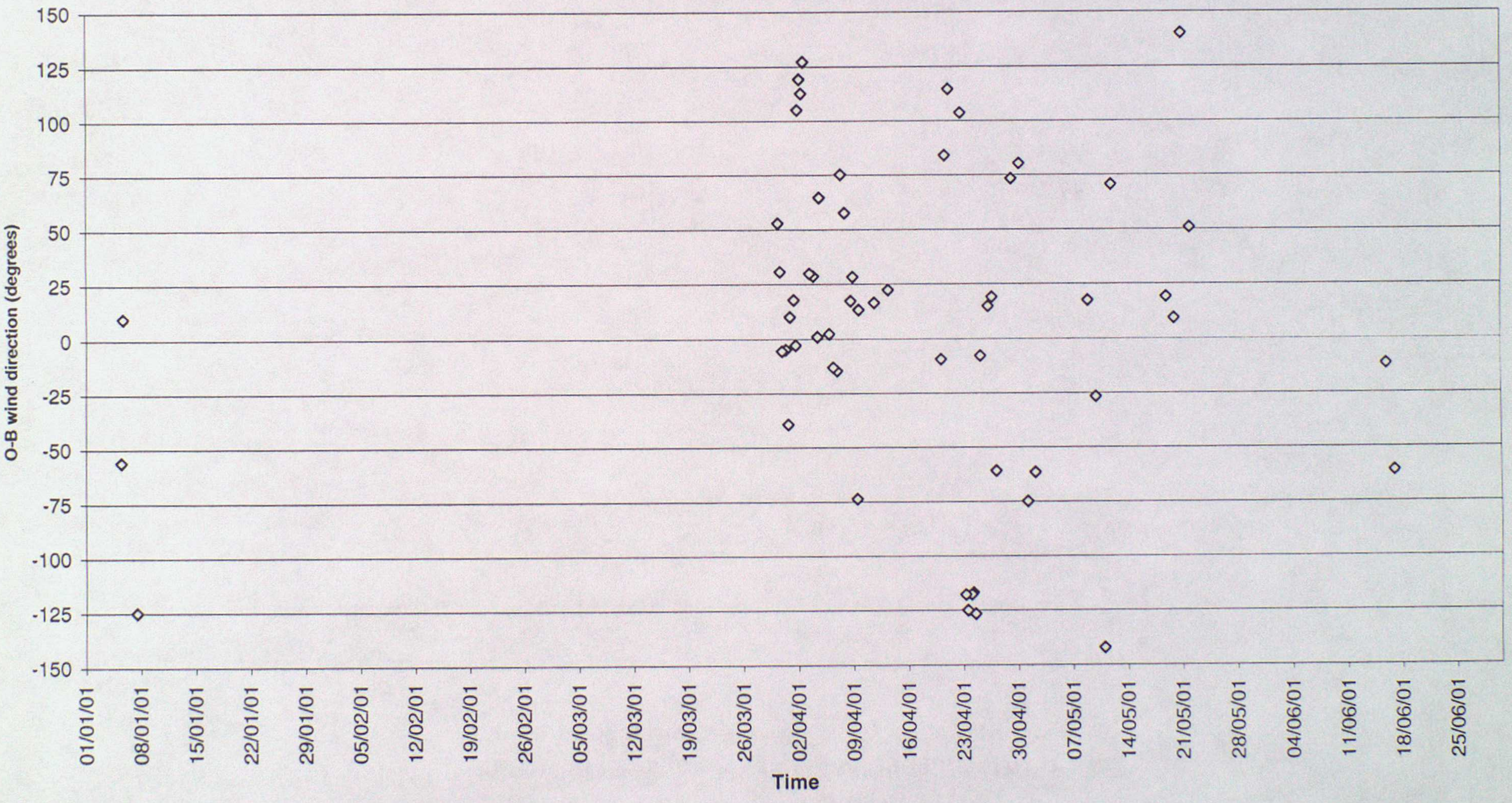
## O-B wind direction (degrees) for identifier SCFH
Number of obs. plotted = 58    Number of outliers = 0



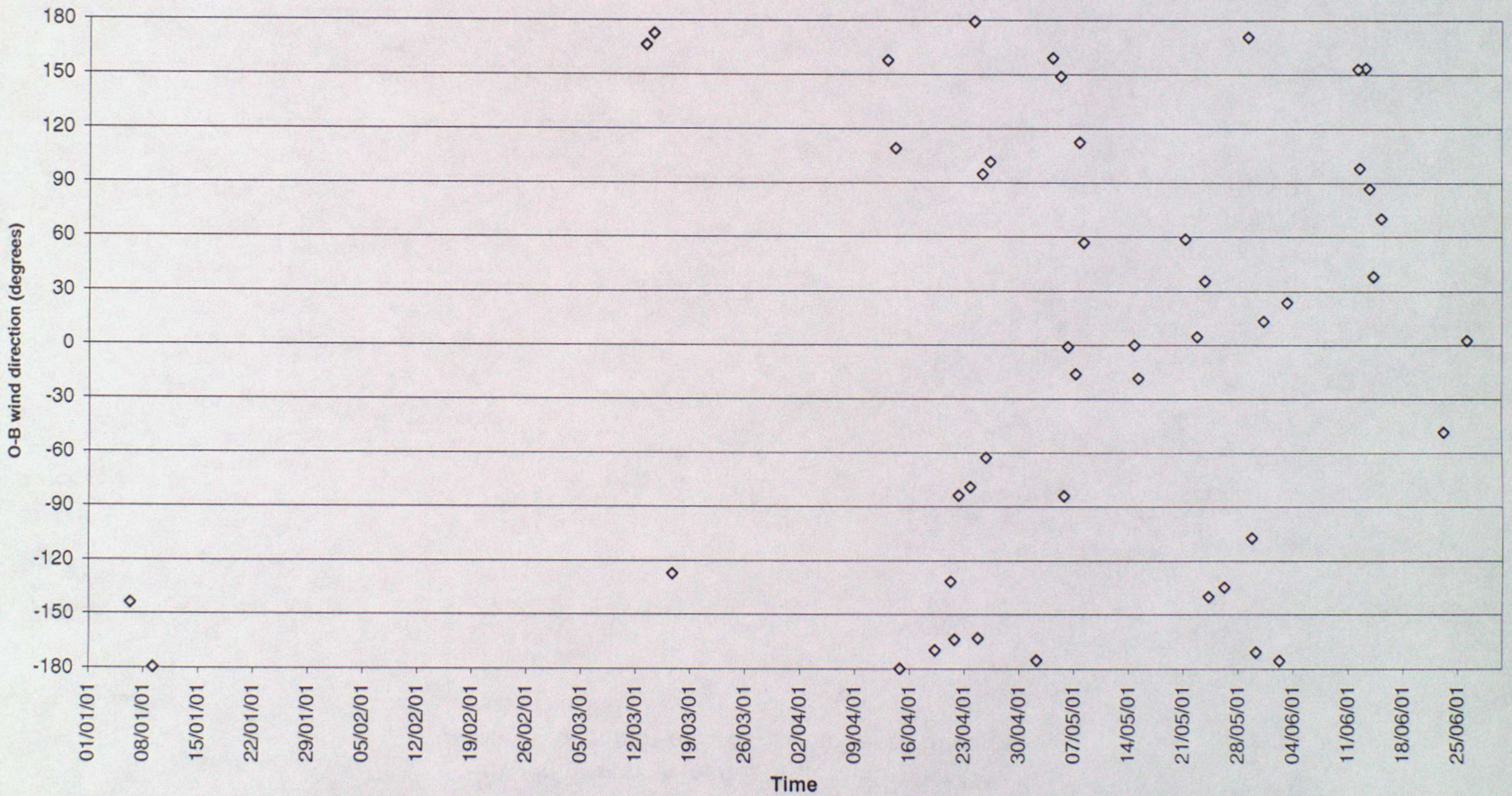
O-B wind direction (degrees) for identifier S6JM
Number of obs. plotted = 216    Number of outliers = 0



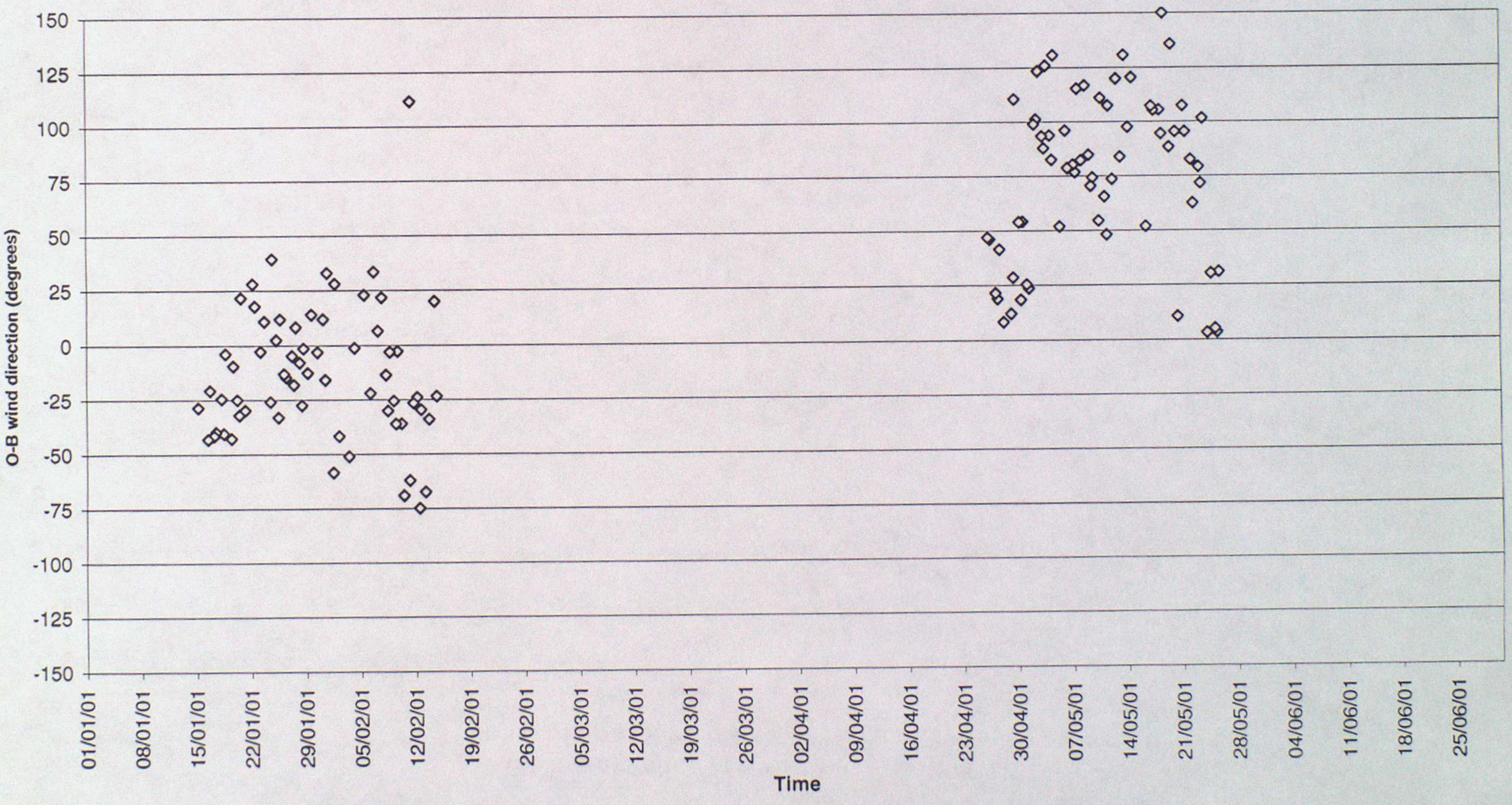
O-B wind direction (degrees) for identifier UAZX
Number of obs. plotted = 57    Number of outliers = 0



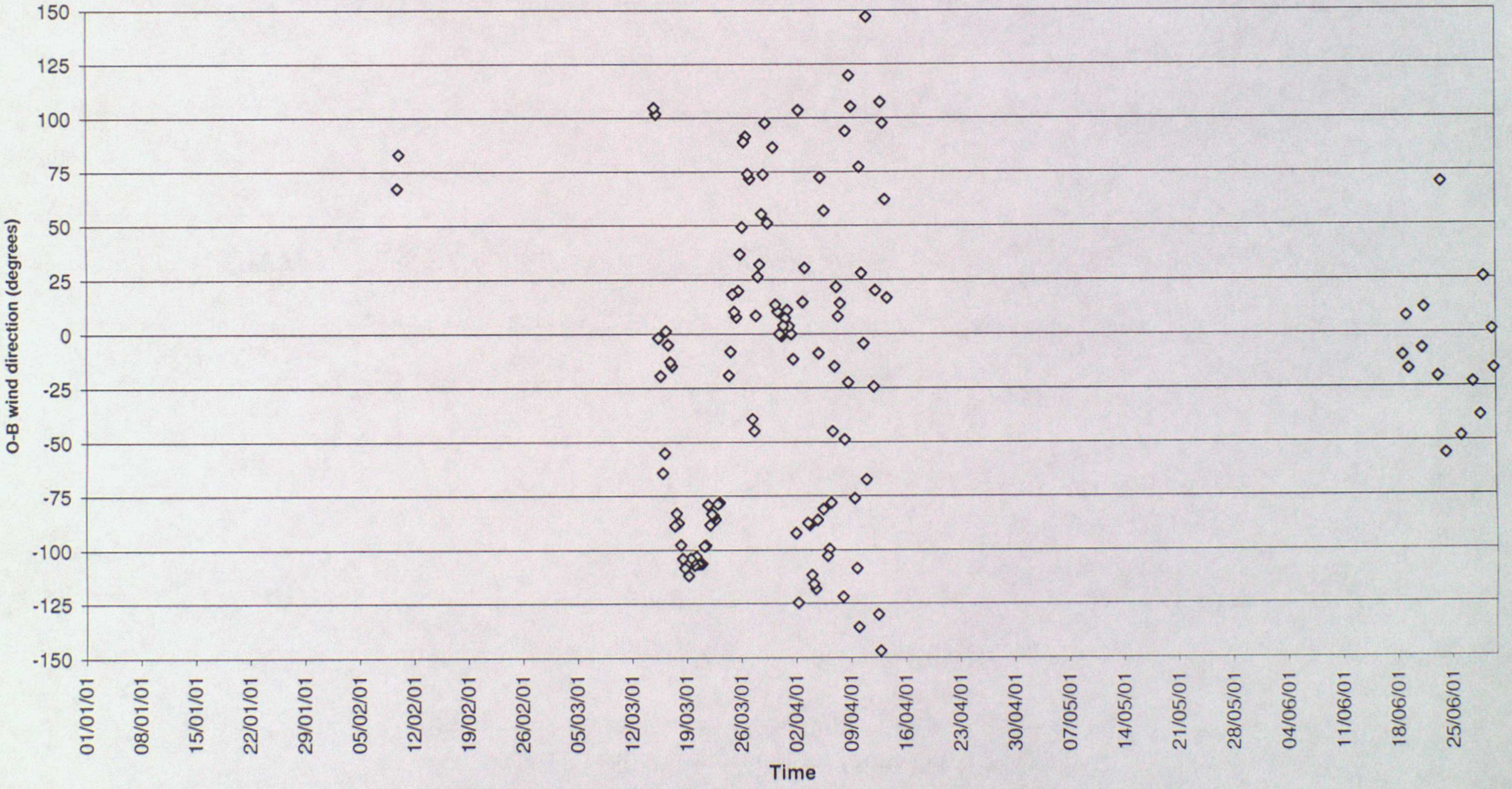
O-B wind direction (degrees) for identifier UBDP
Number of obs. plotted = 47    Number of outliers = 0



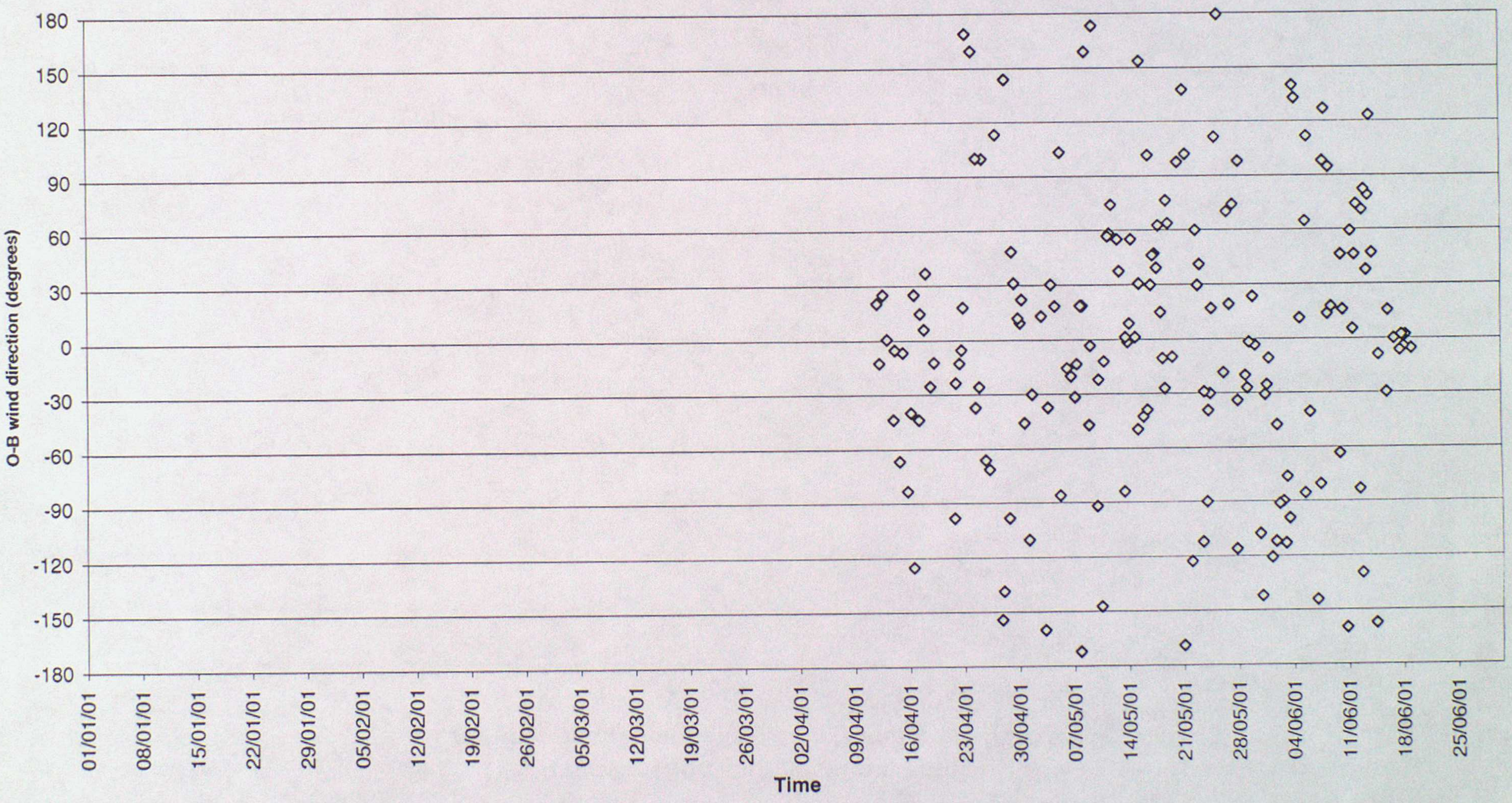
O-B wind direction (degrees) for identifier UBXS
Number of obs. plotted = 132    Number of outliers = 2



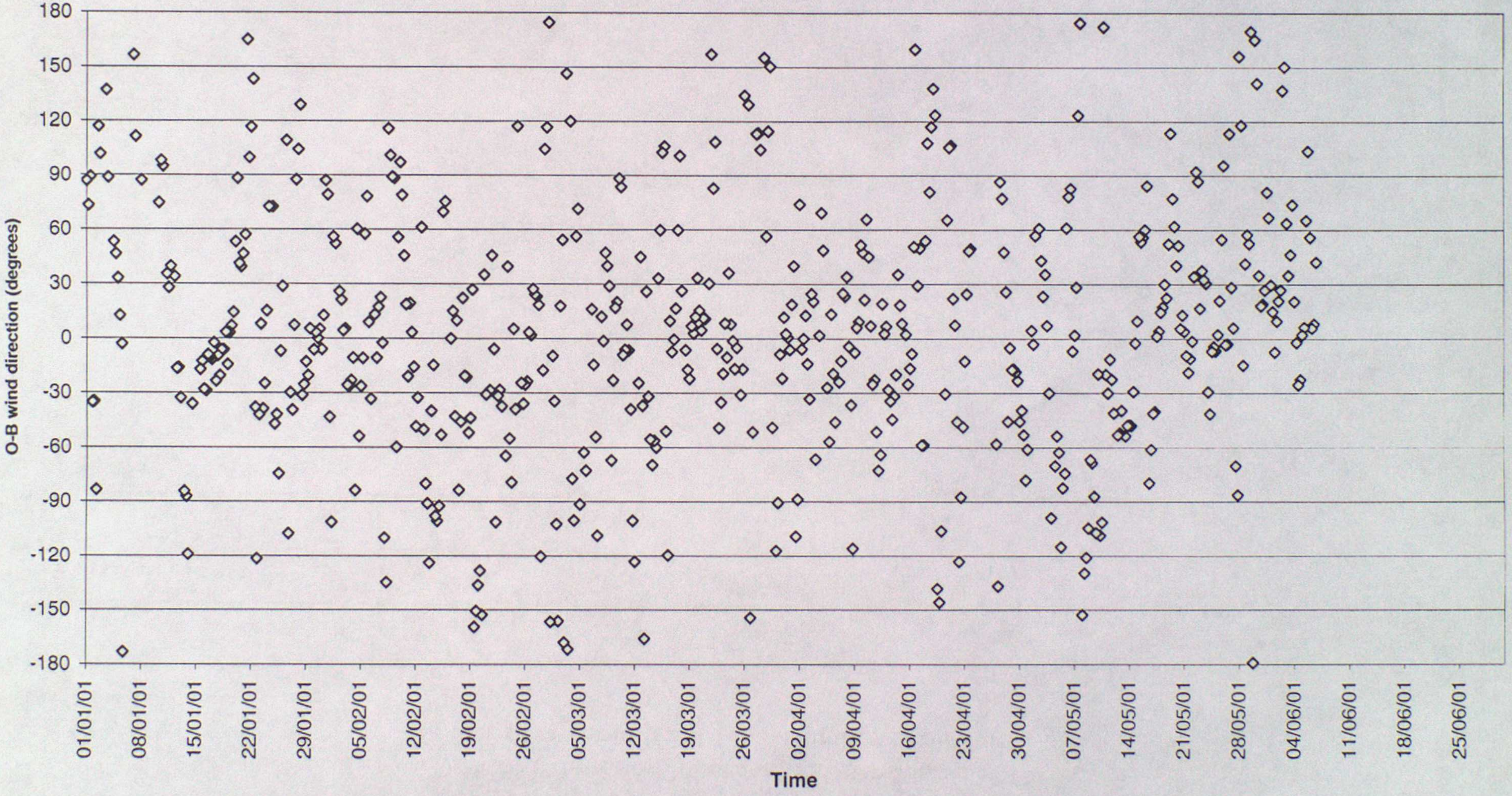
O-B wind direction (degrees) for identifier UCUF
Number of obs. plotted = 127    Number of outliers = 4

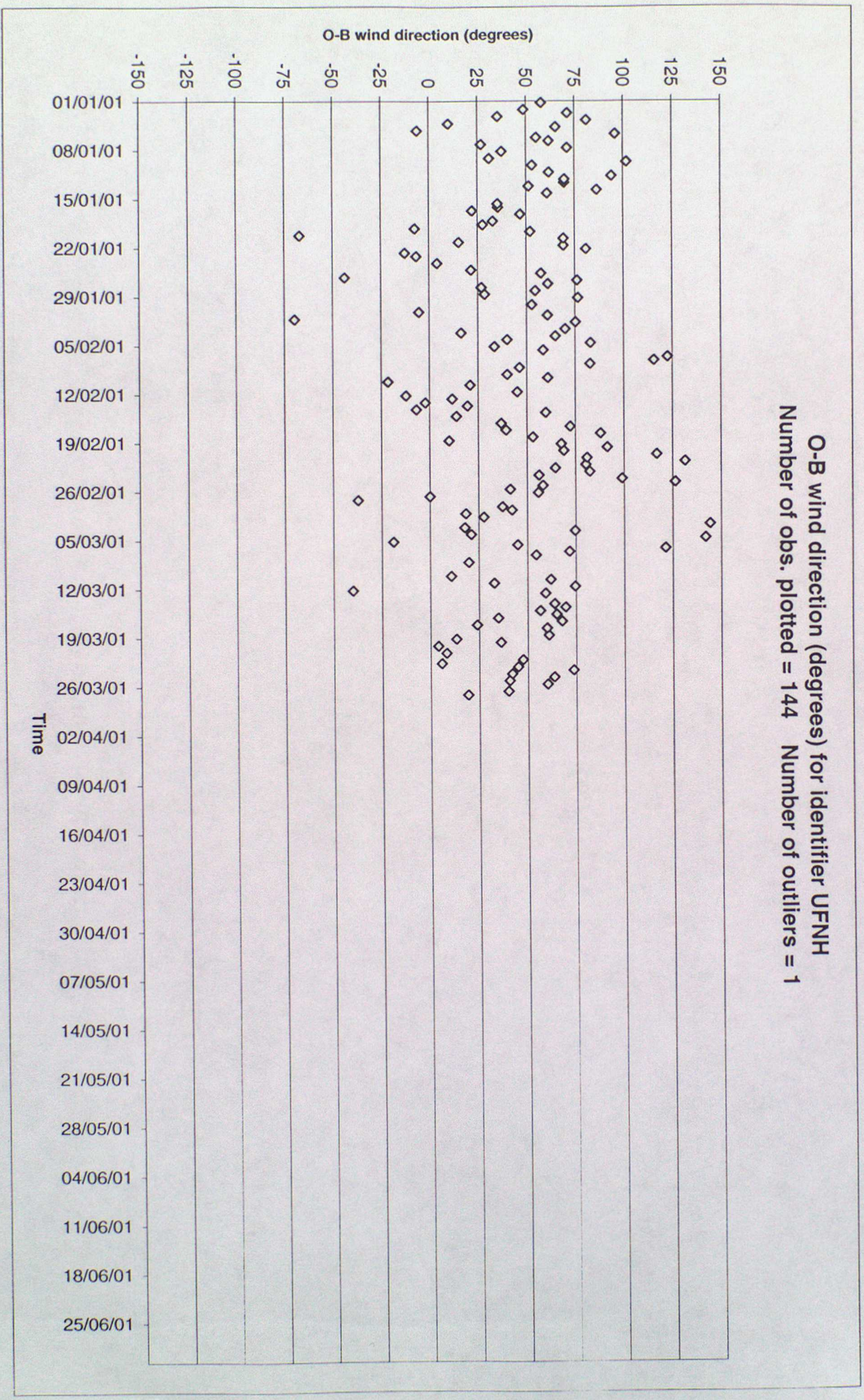


**O-B wind direction (degrees) for identifier UDCY**
**Number of obs. plotted = 175    Number of outliers = 0**



## O-B wind direction (degrees) for identifier UDYG
Number of obs. plotted = 558    Number of outliers = 0

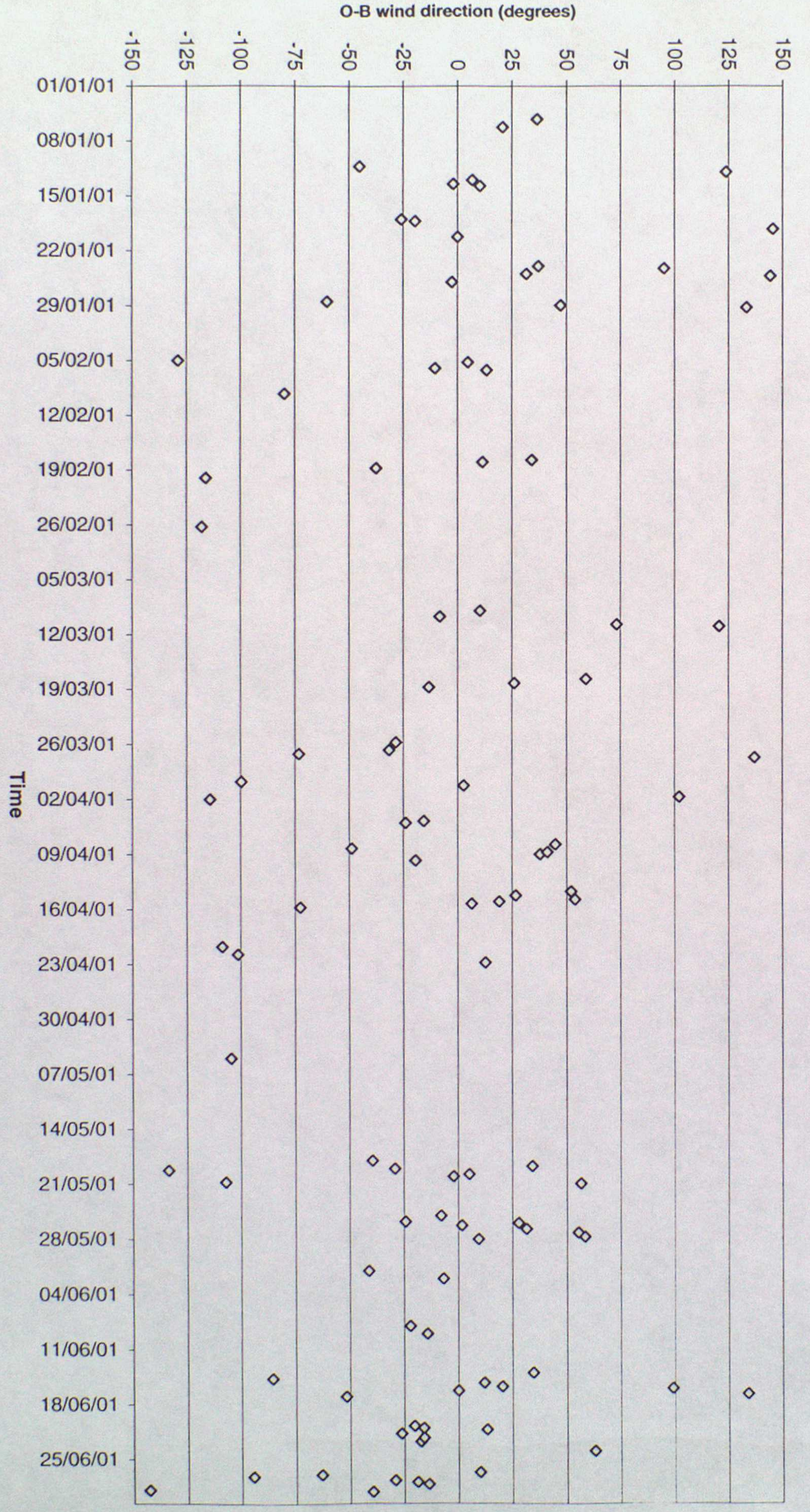




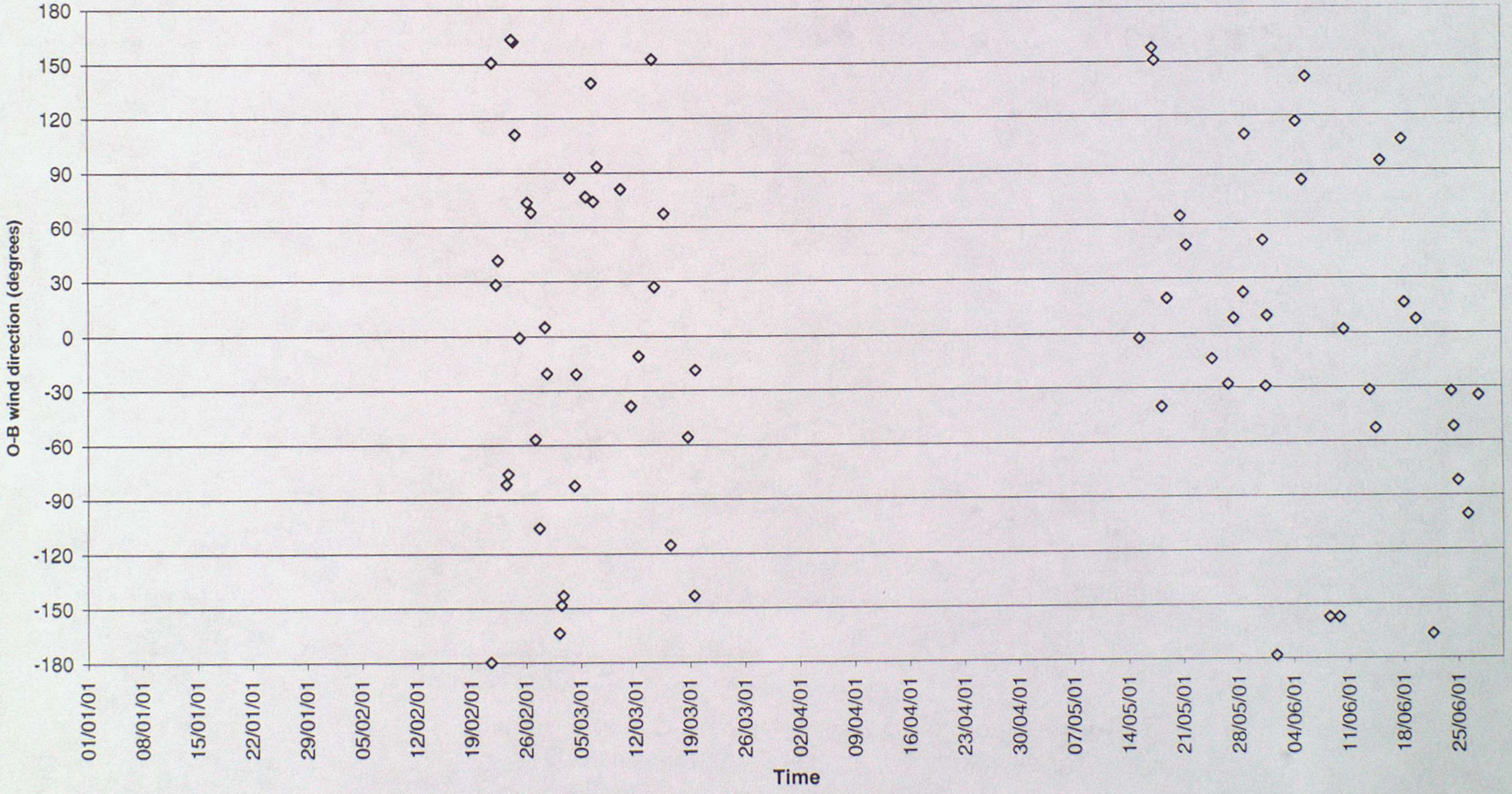
O-B wind direction (degrees) for identifier UFNH
Number of obs. plotted = 144 Number of outliers = 1

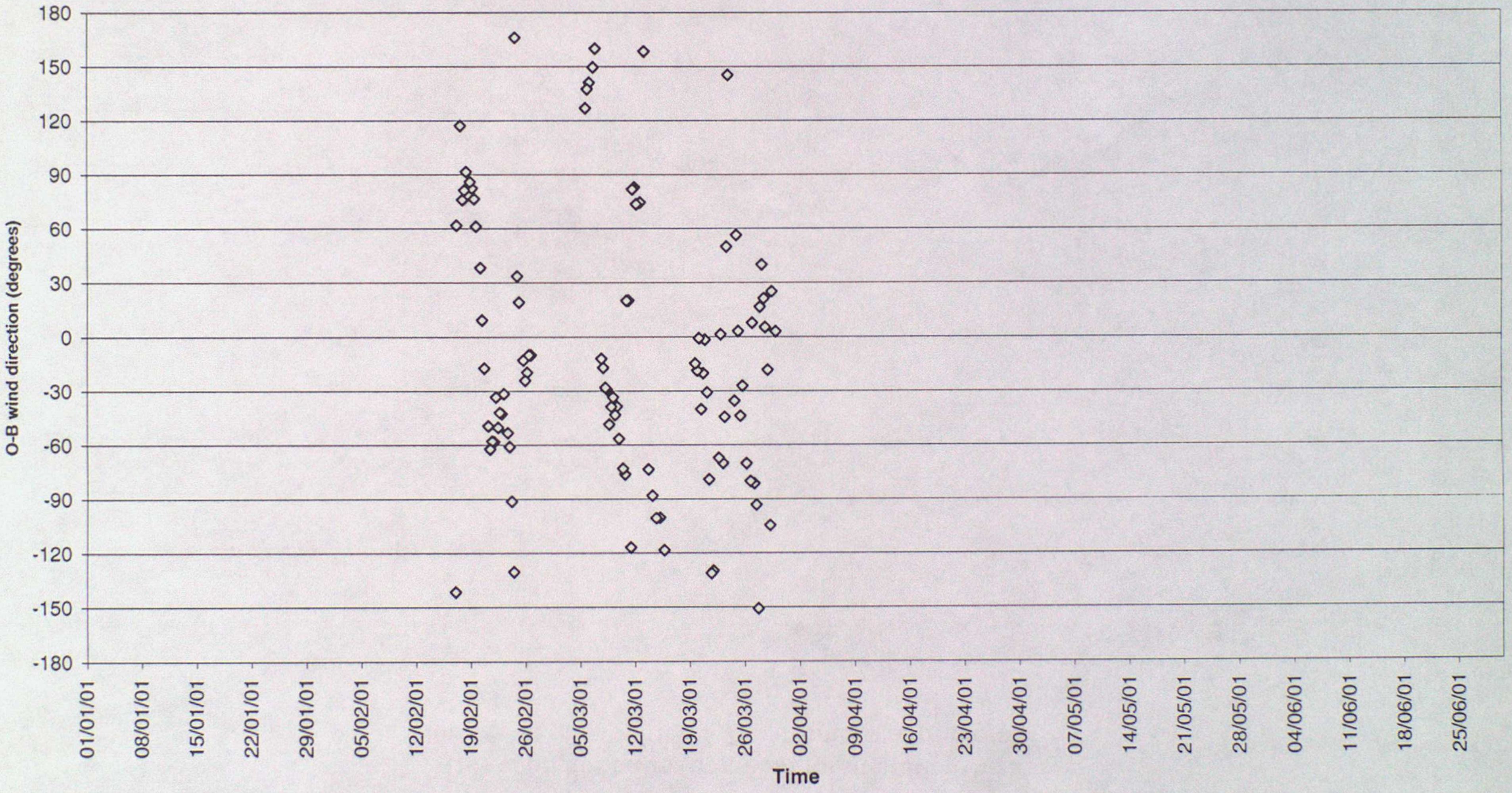
## O-B wind direction (degrees) for identifier UGTV

Number of obs. plotted = 104 Number of outliers = 3

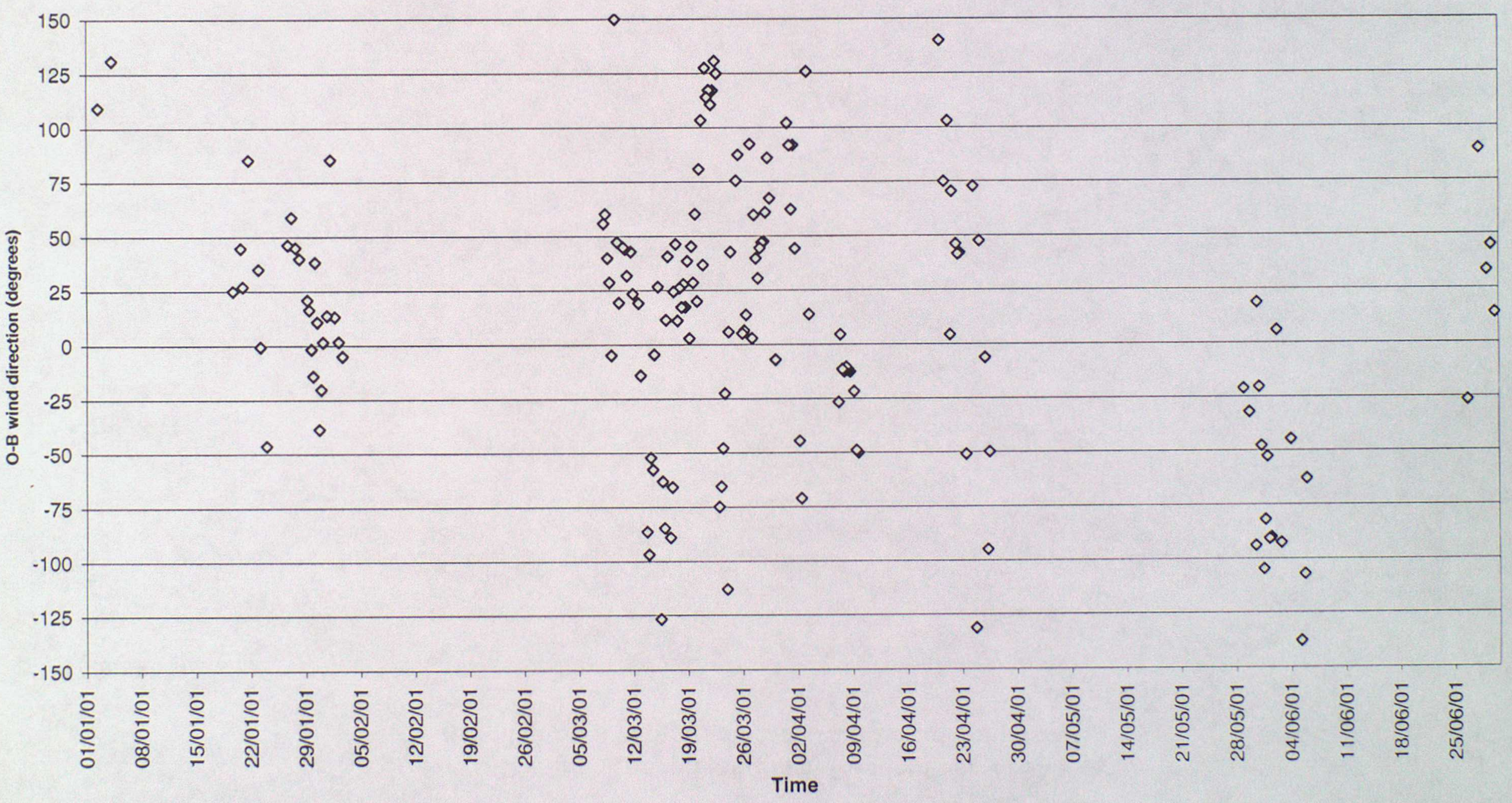


O-B wind direction (degrees) for identifier UIDS
Number of obs. plotted = 70    Number of outliers = 0

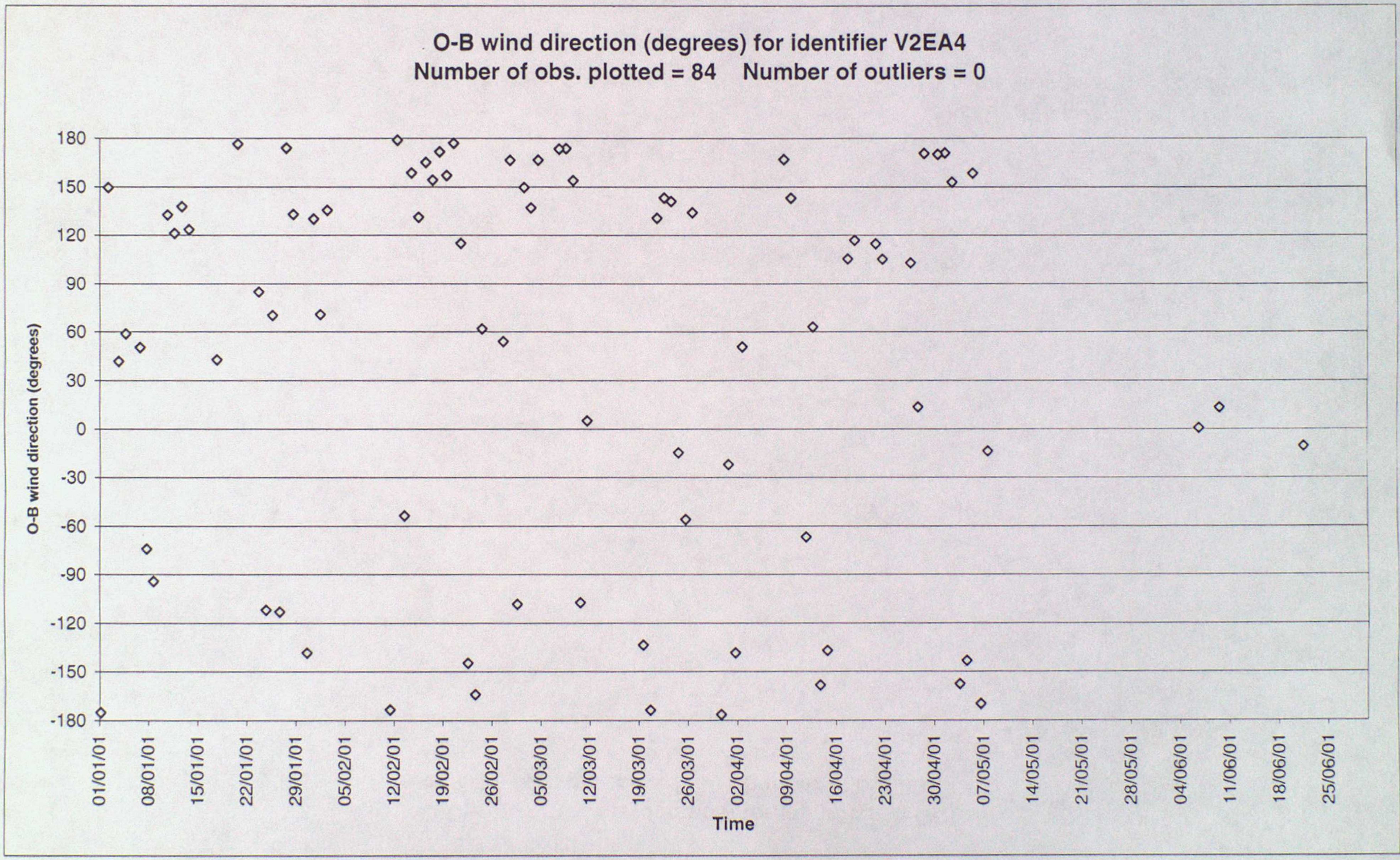




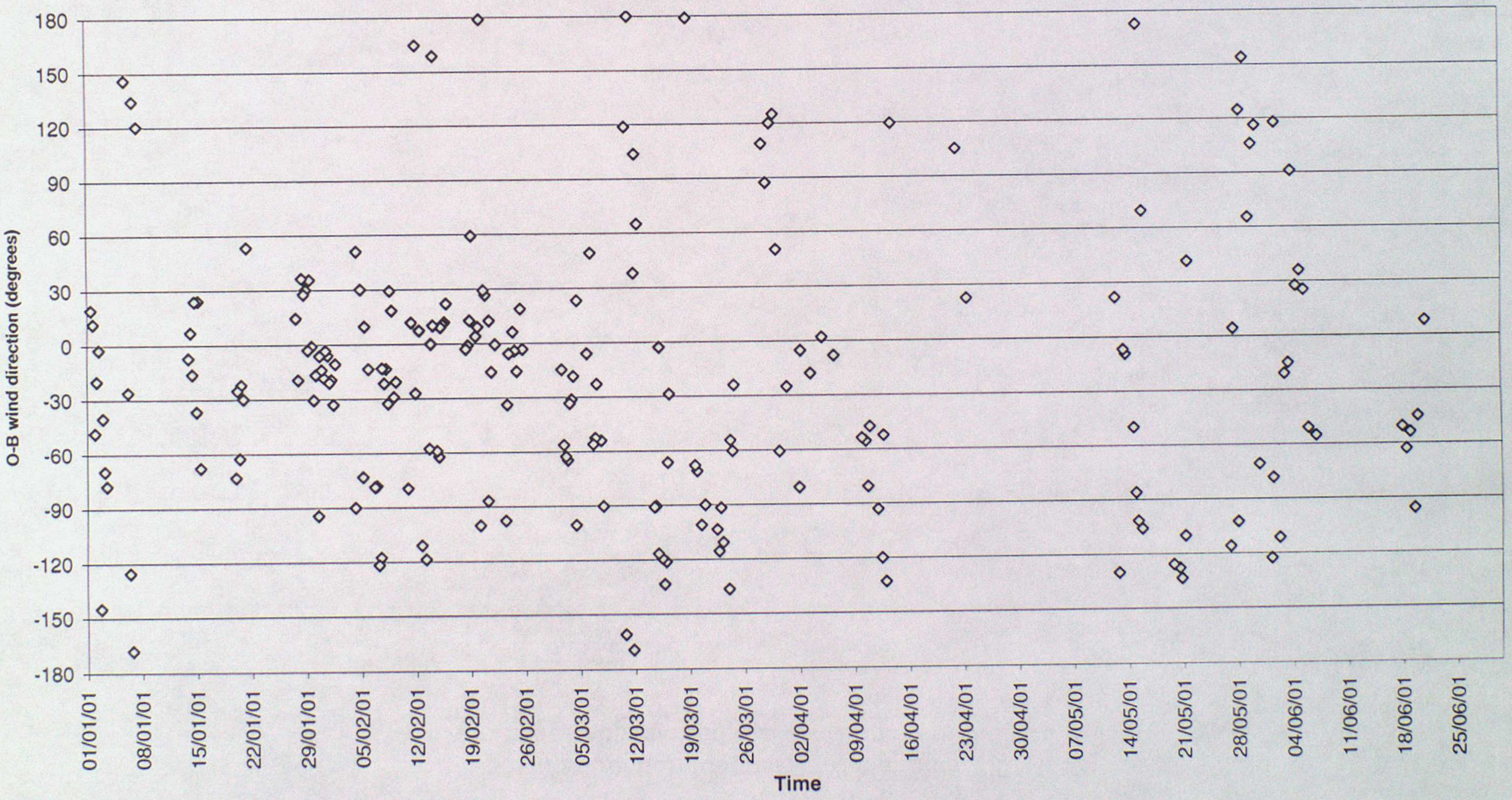
O-B wind direction (degrees) for identifier VRVJ5
Number of obs. plotted = 99    Number of outliers = 0



O-B wind direction (degrees) for identifier VVGC
Number of obs. plotted = 158    Number of outliers = 6

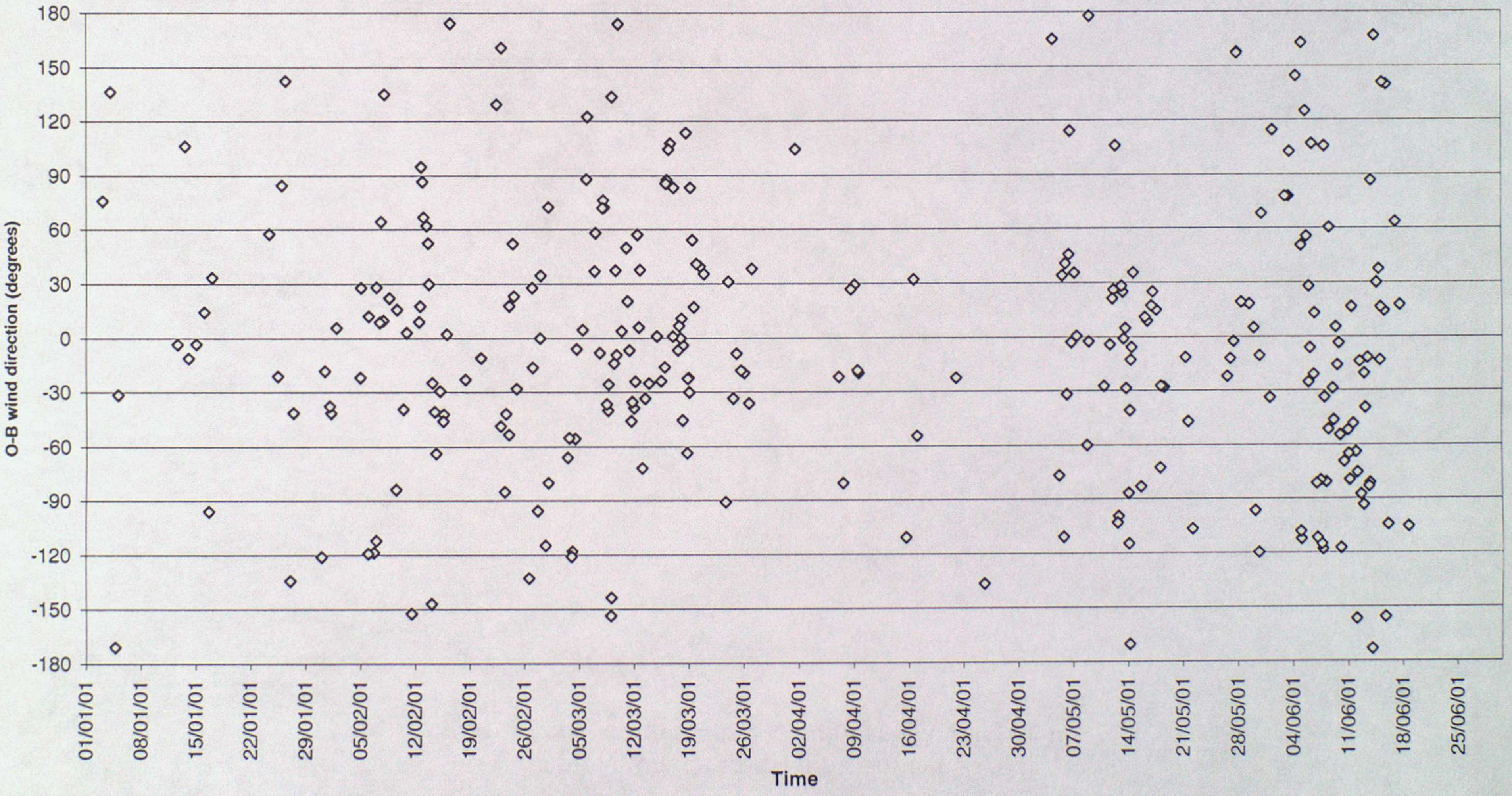


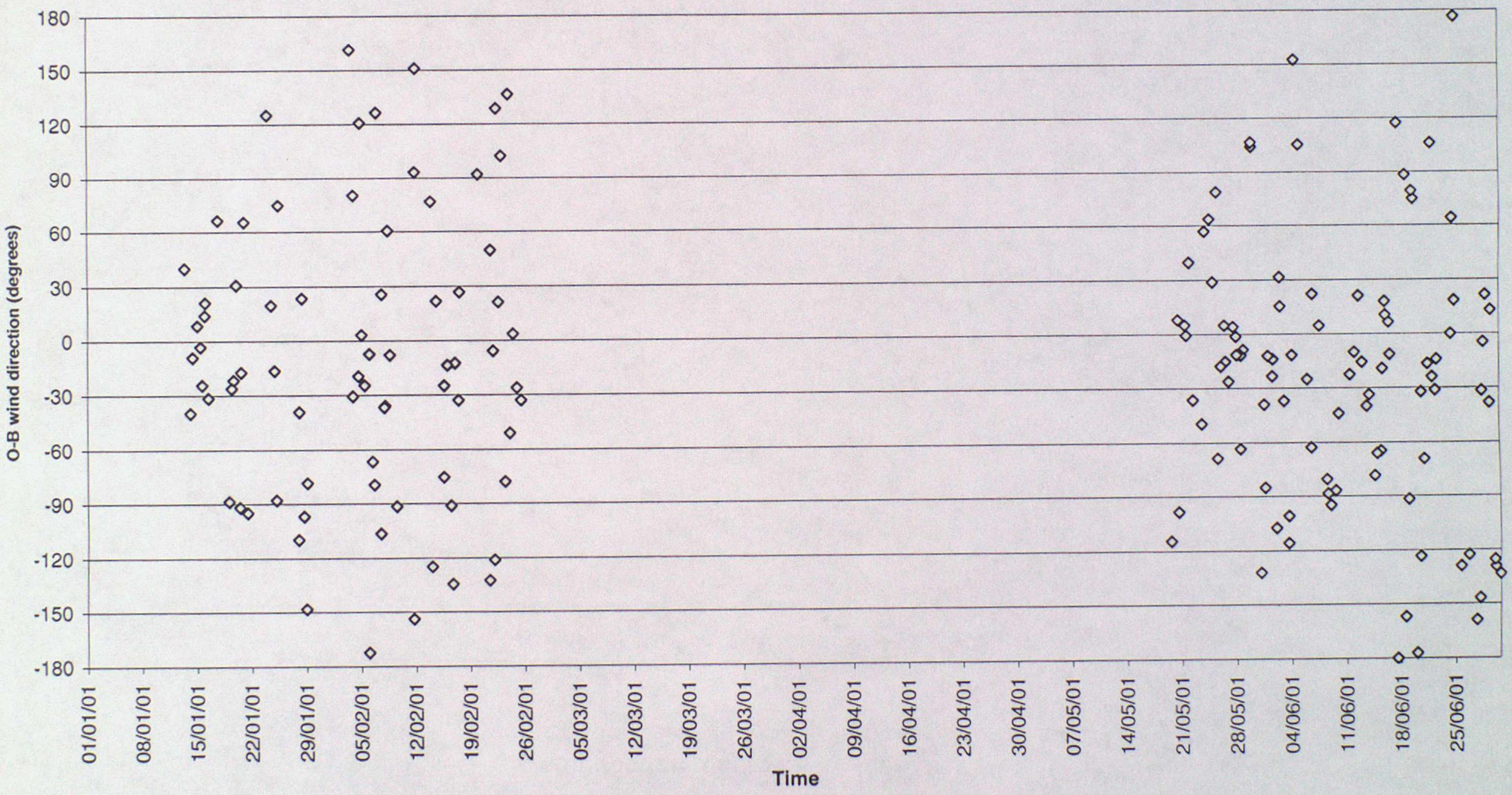
O-B wind direction (degrees) for identifier V2EA4
Number of obs. plotted = 84 Number of outliers = 0



O-B wind direction (degrees) for identifier V7AT9
Number of obs. plotted = 215 Number of outliers = 0

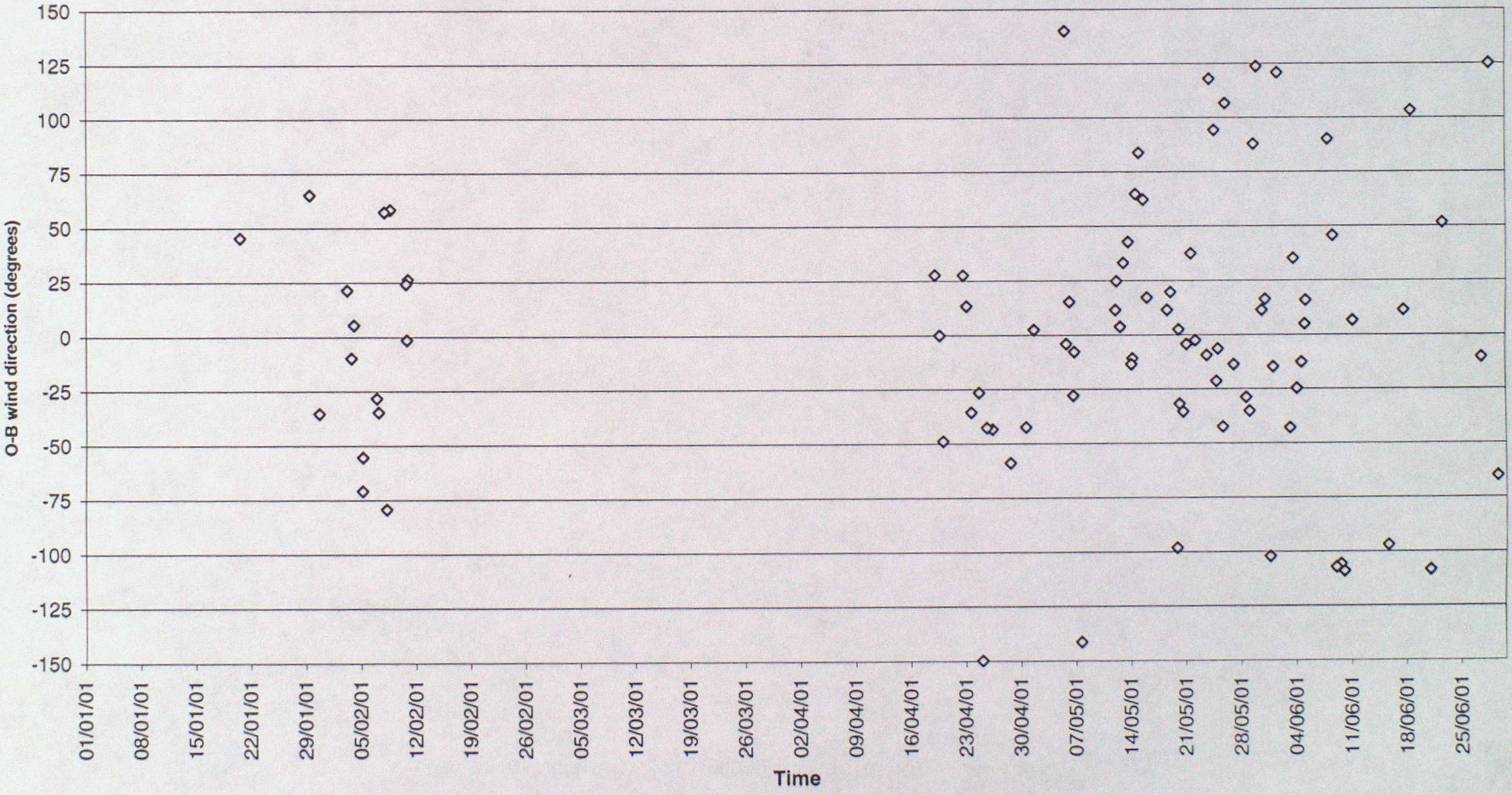
O-B wind direction (degrees) for identifier WBN4383
Number of obs. plotted = 286    Number of outliers = 0



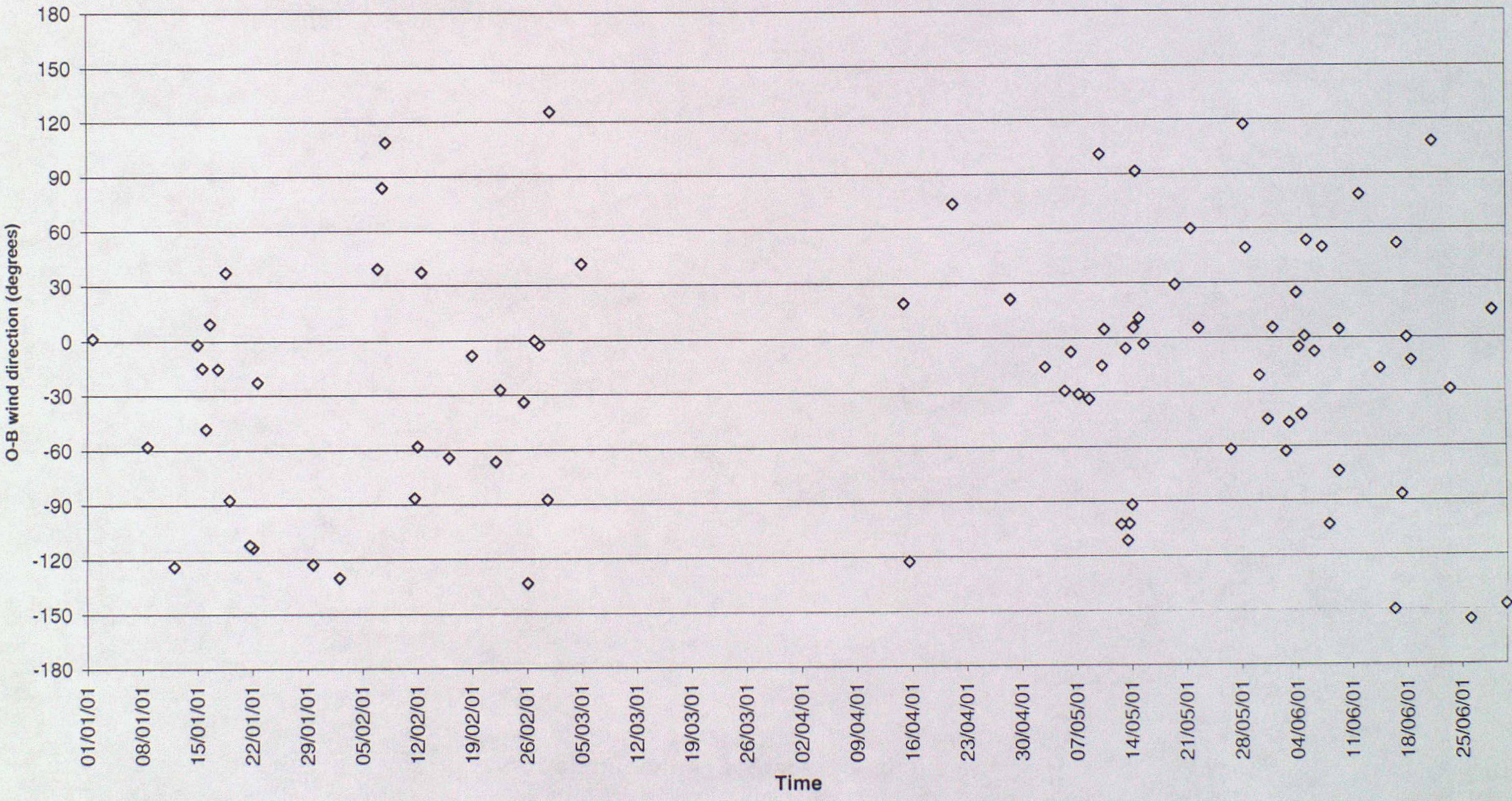


O-B wind direction (degrees) for identifier WBO2511
Number of obs. plotted = 171    Number of outliers = 0

O-B wind direction (degrees) for identifier WCN4995
Number of obs. plotted = 92    Number of outliers = 2

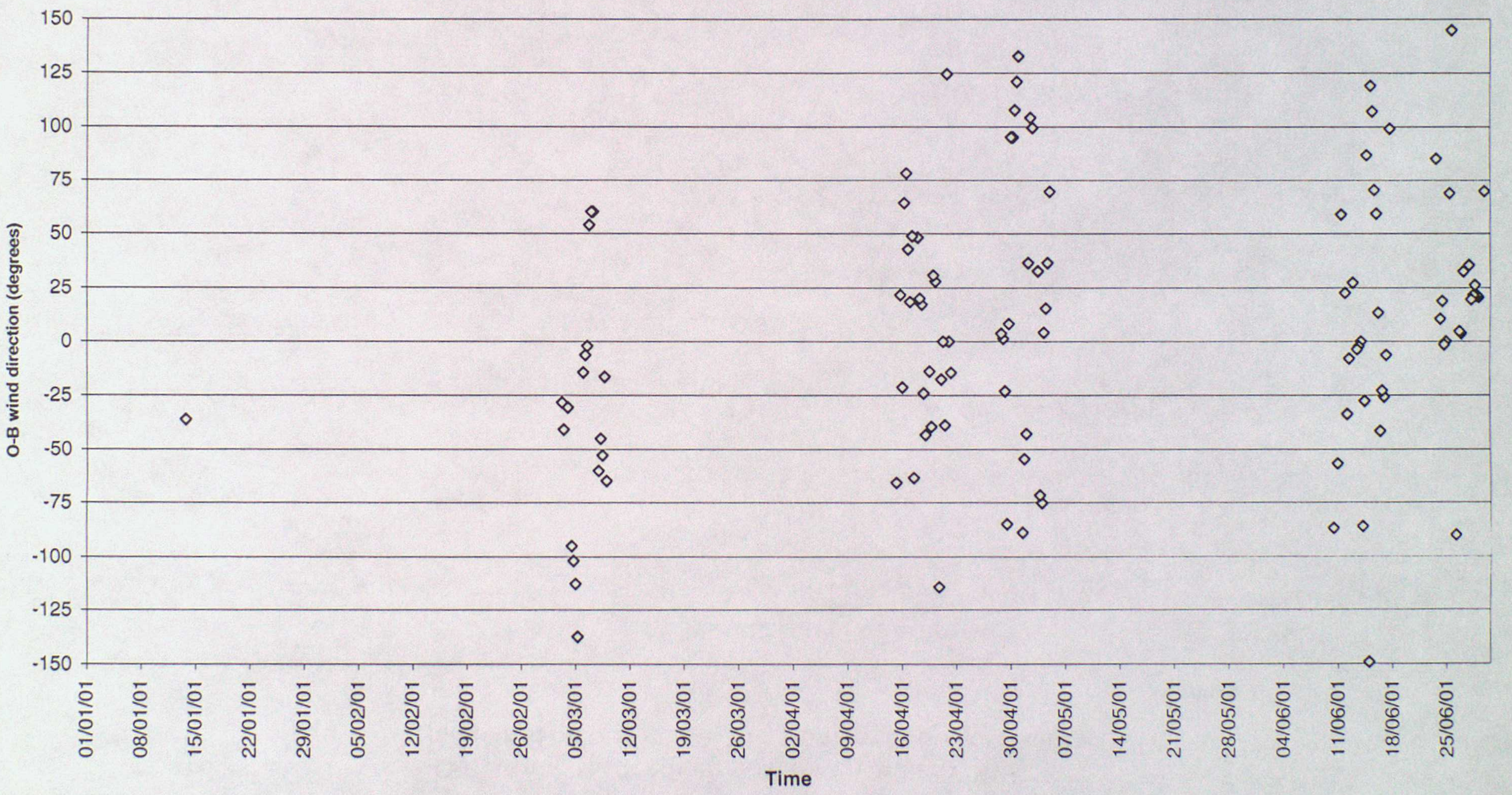


O-B wind direction (degrees) for identifier WNGW
Number of obs. plotted = 86    Number of outliers = 0

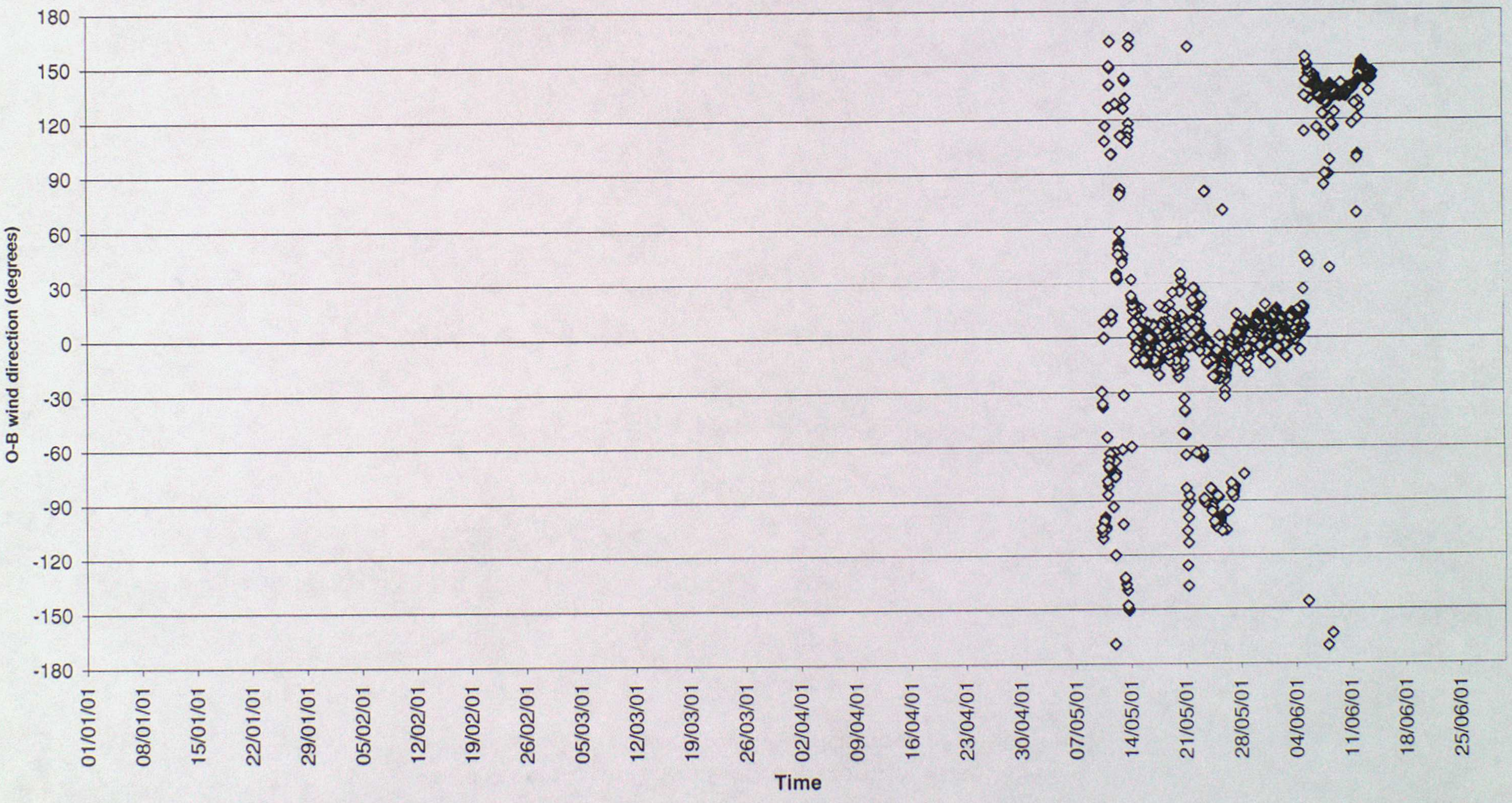


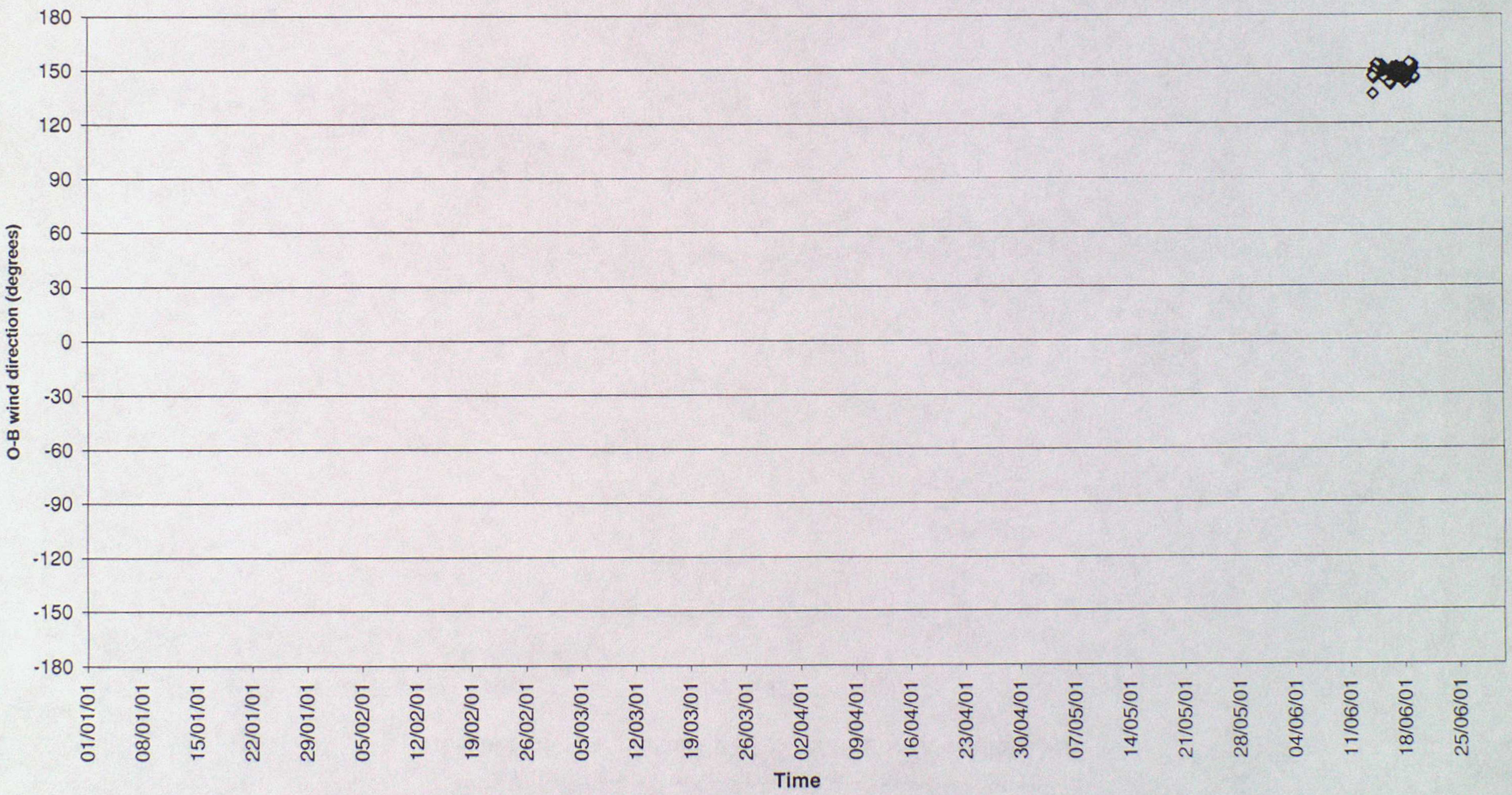
## O-B wind direction (degrees) for identifier ZDDT5

Number of obs. plotted = 109    Number of outliers = 3



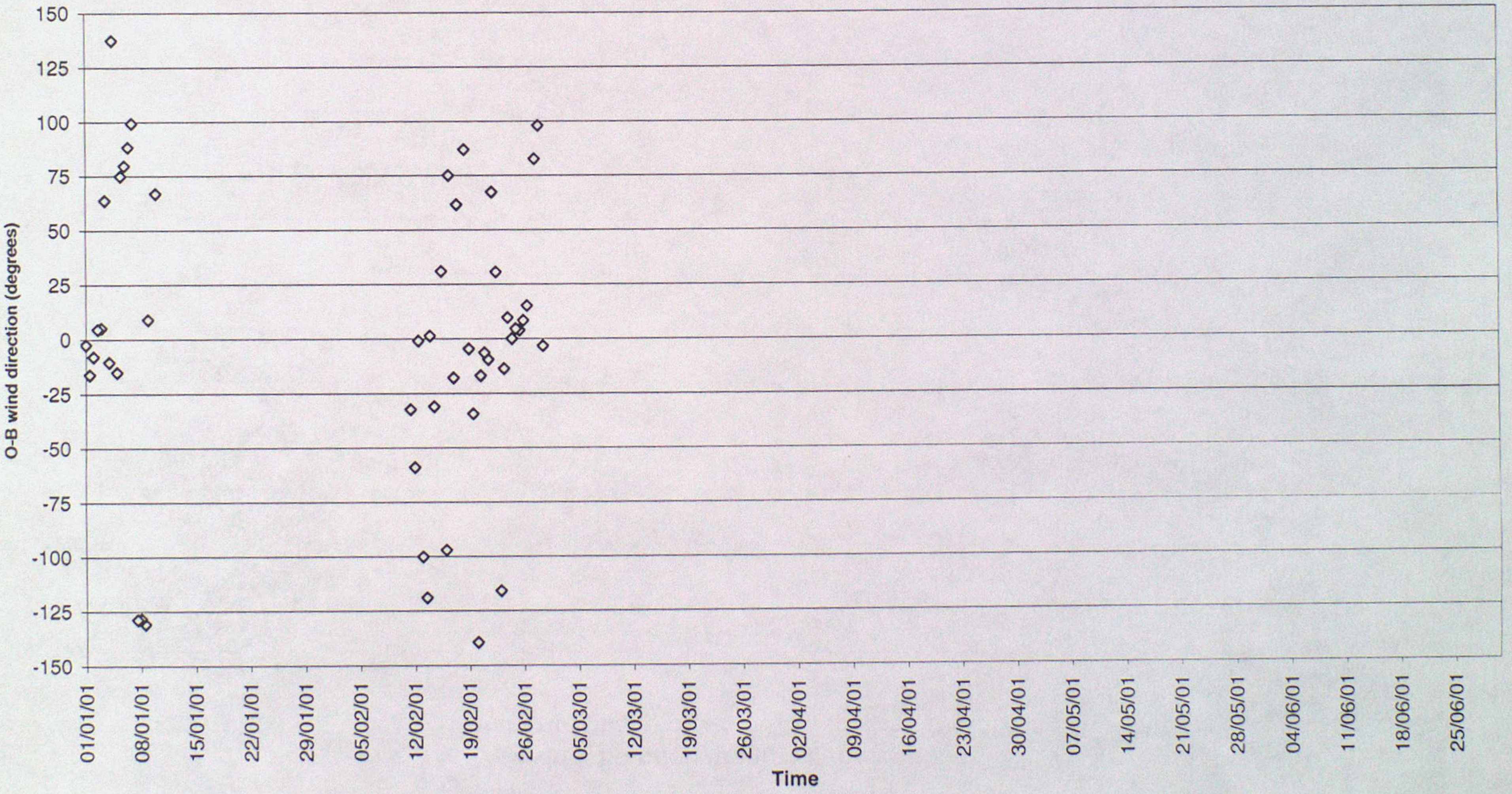
O-B wind direction (degrees) for identifier 23913
Number of obs. plotted = 772    Number of outliers = 0

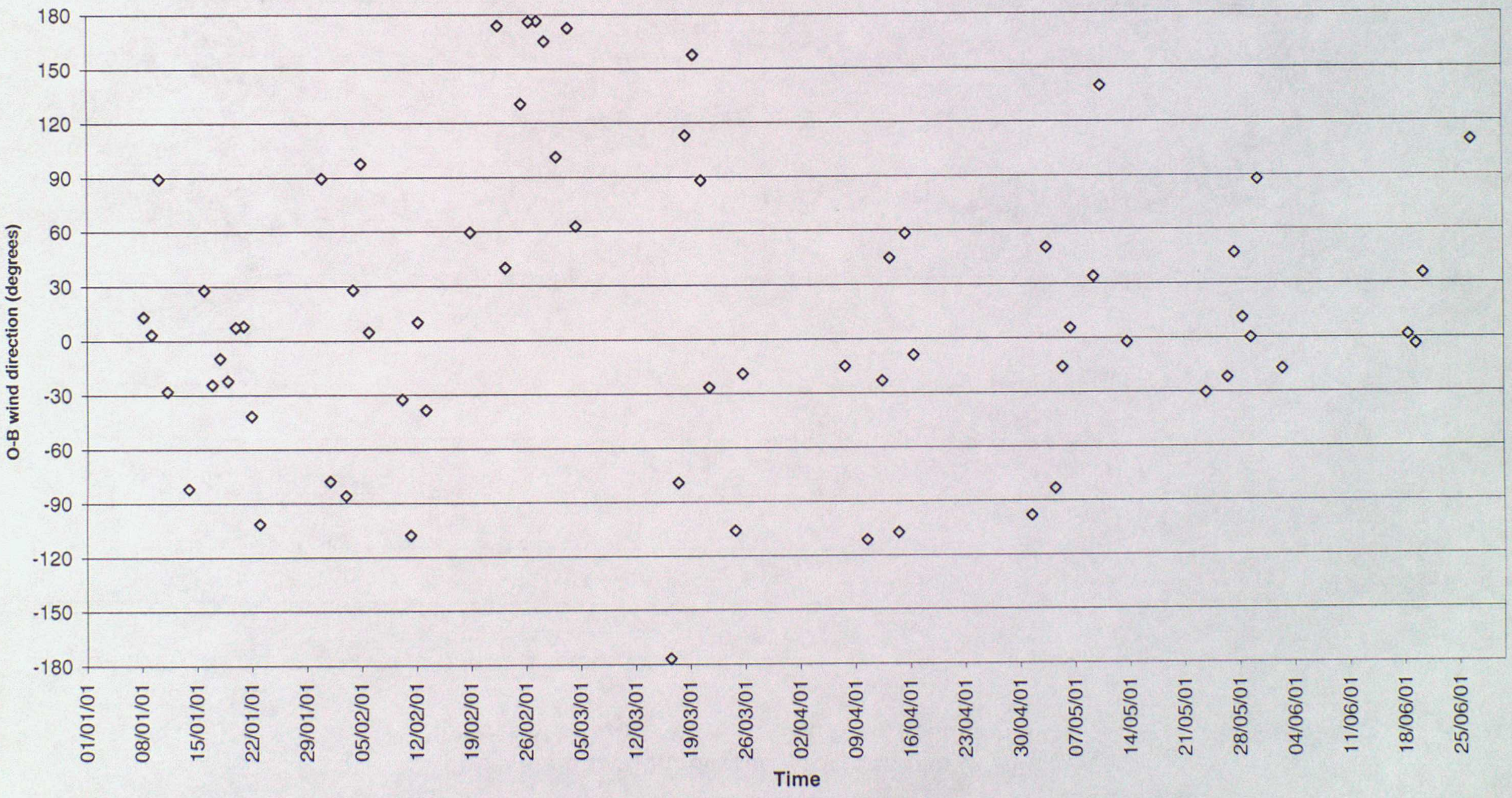




O-B wind direction (degrees) for identifier 23948
Number of obs. plotted = 114    Number of outliers = 0

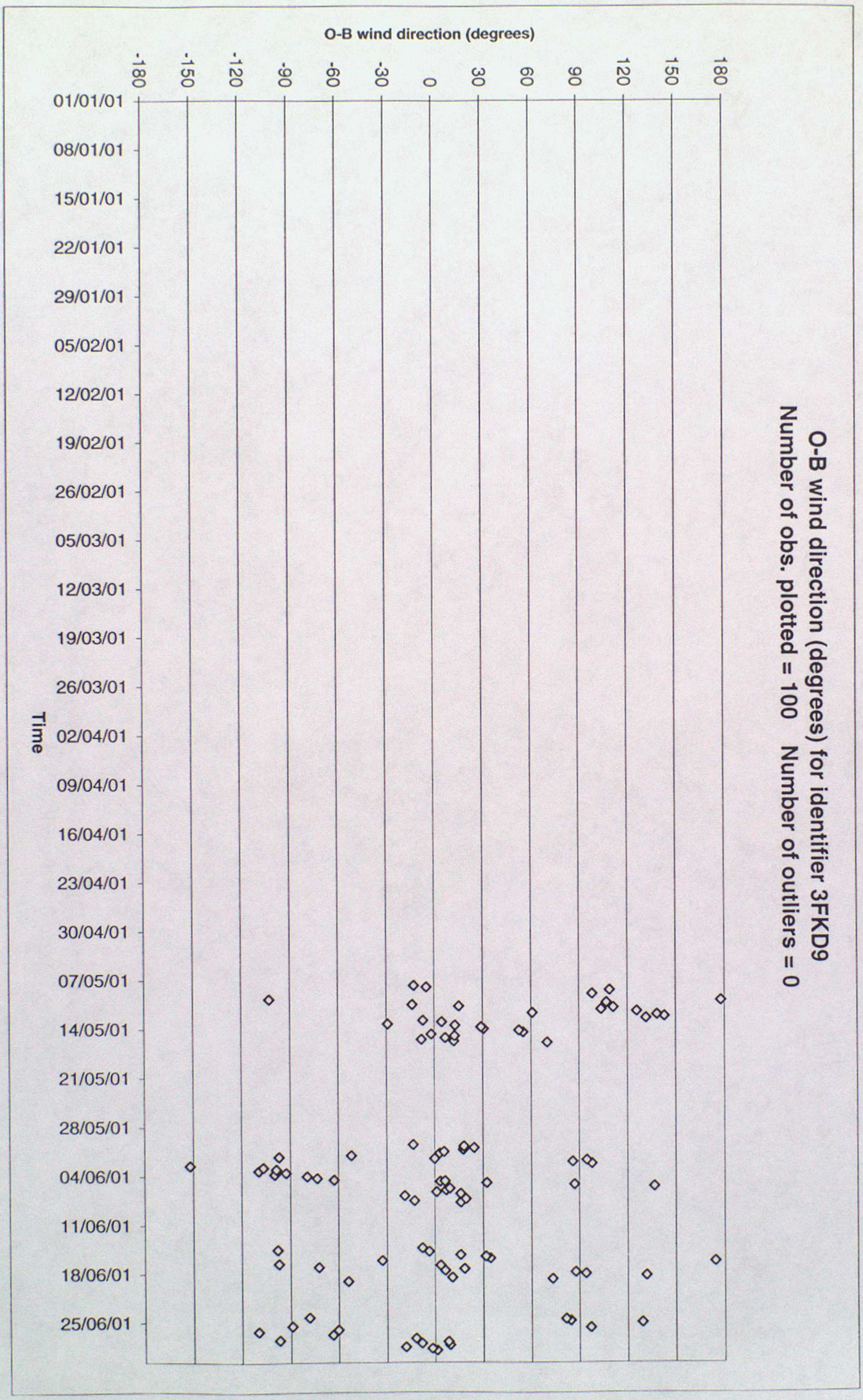
O-B wind direction (degrees) for identifier 3FAV9
Number of obs. plotted = 50    Number of outliers = 1





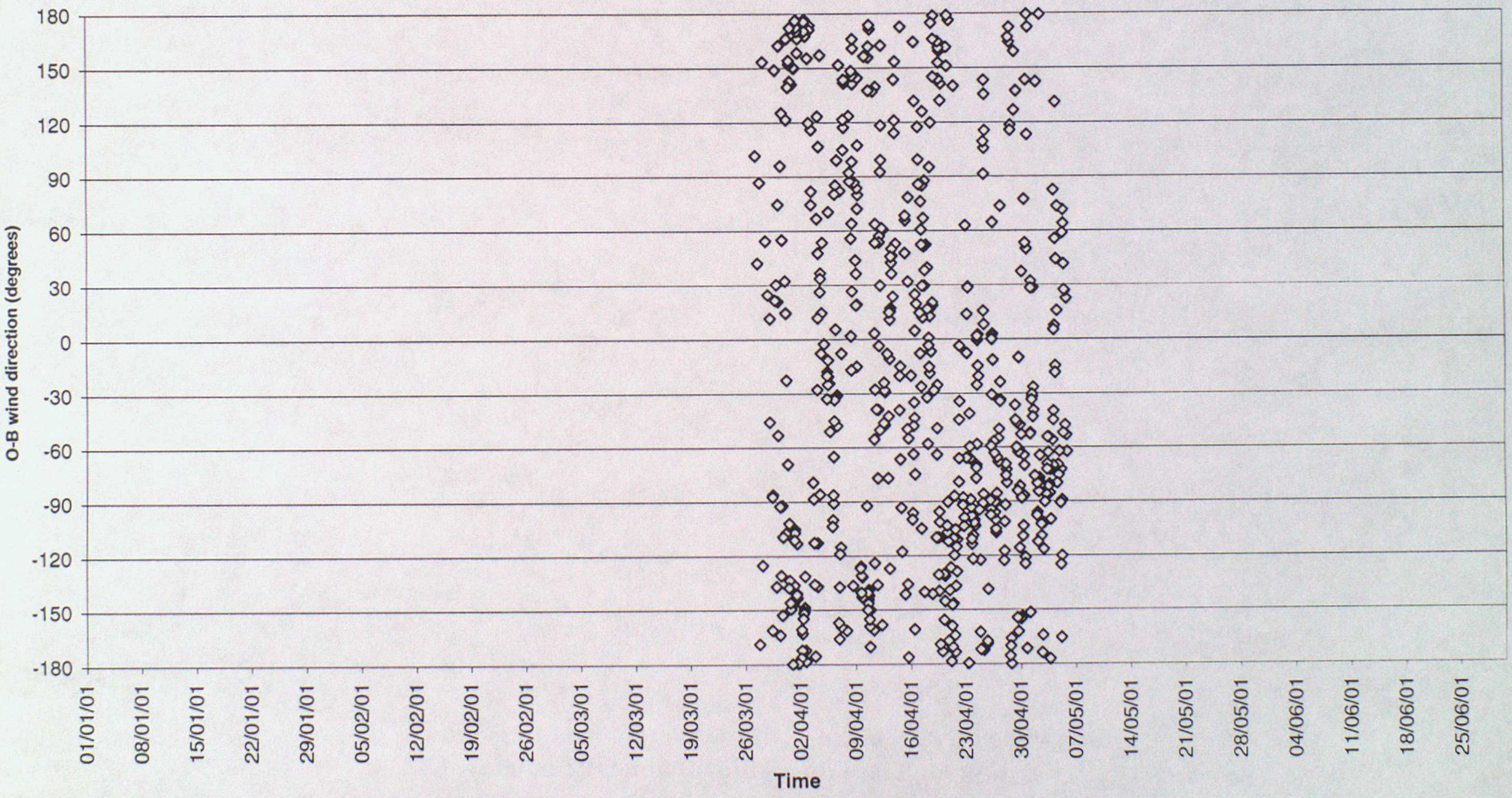
O-B wind direction (degrees) for identifier 3FEY7

Number of obs. plotted = 67    Number of outliers = 0

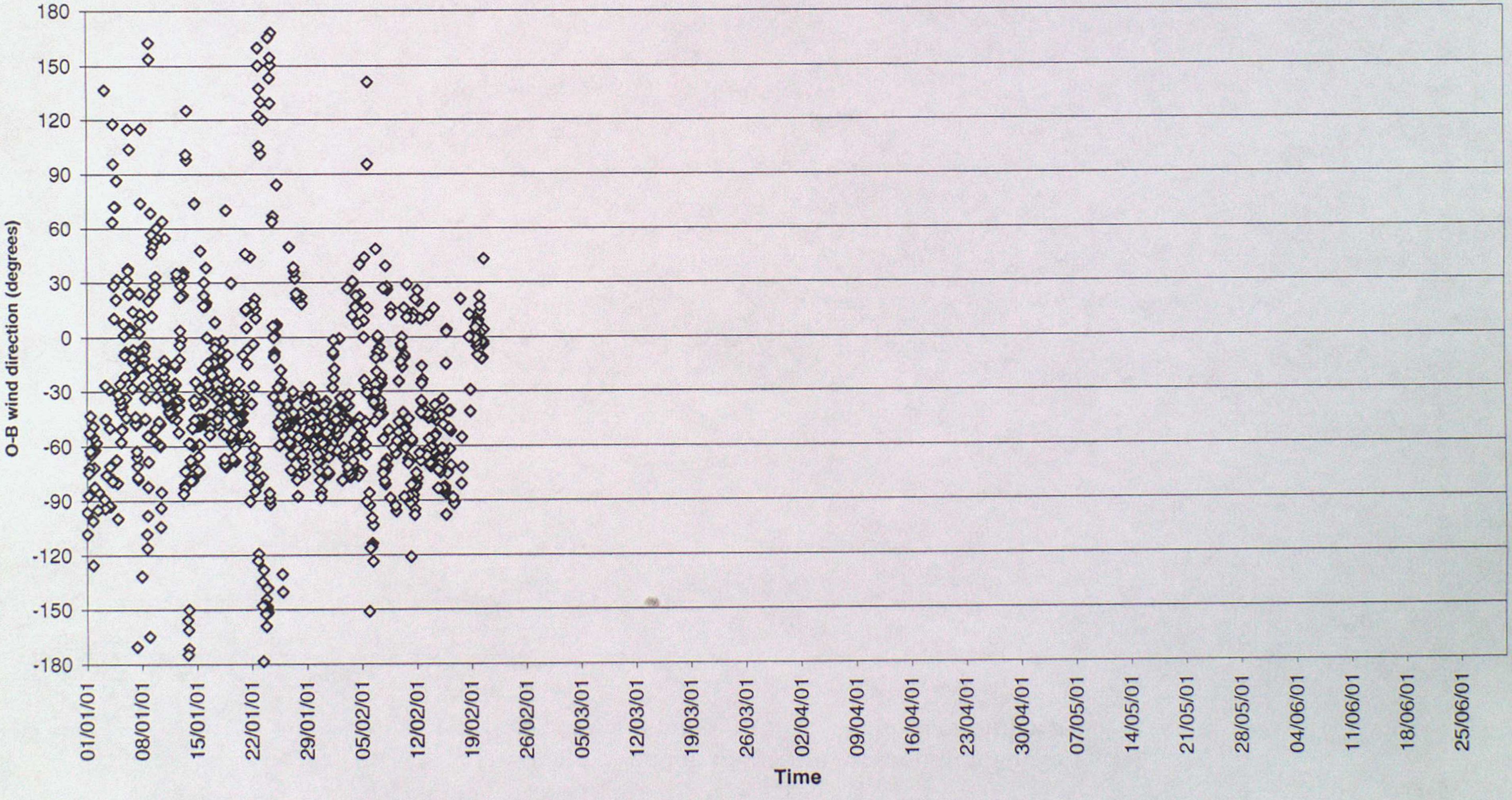


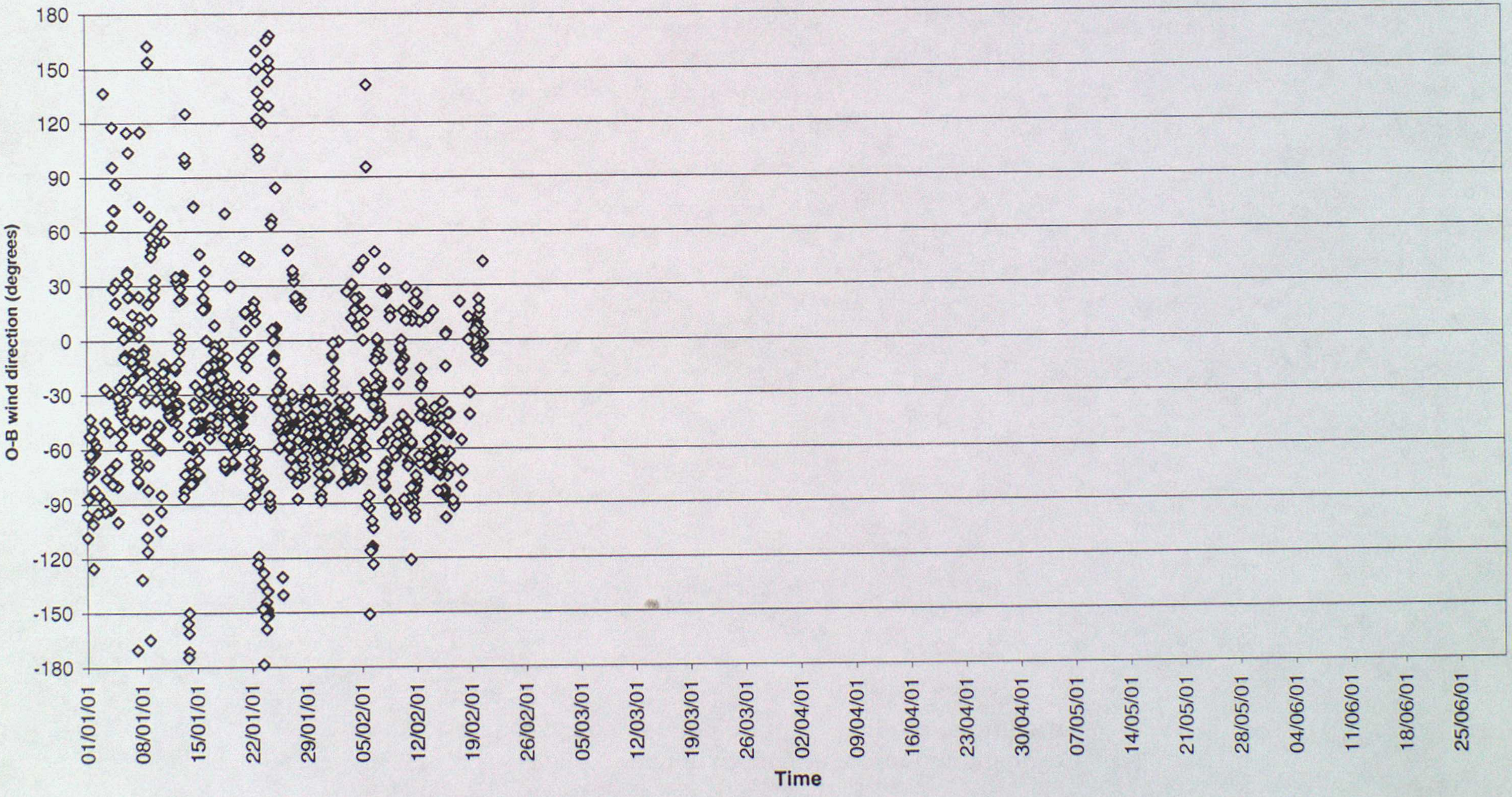
O-B wind direction (degrees) for identifier 3FKD9
Number of obs. plotted = 100    Number of outliers = 0

O-B wind direction (degrees) for identifier 31980
Number of obs. plotted = 594    Number of outliers = 0

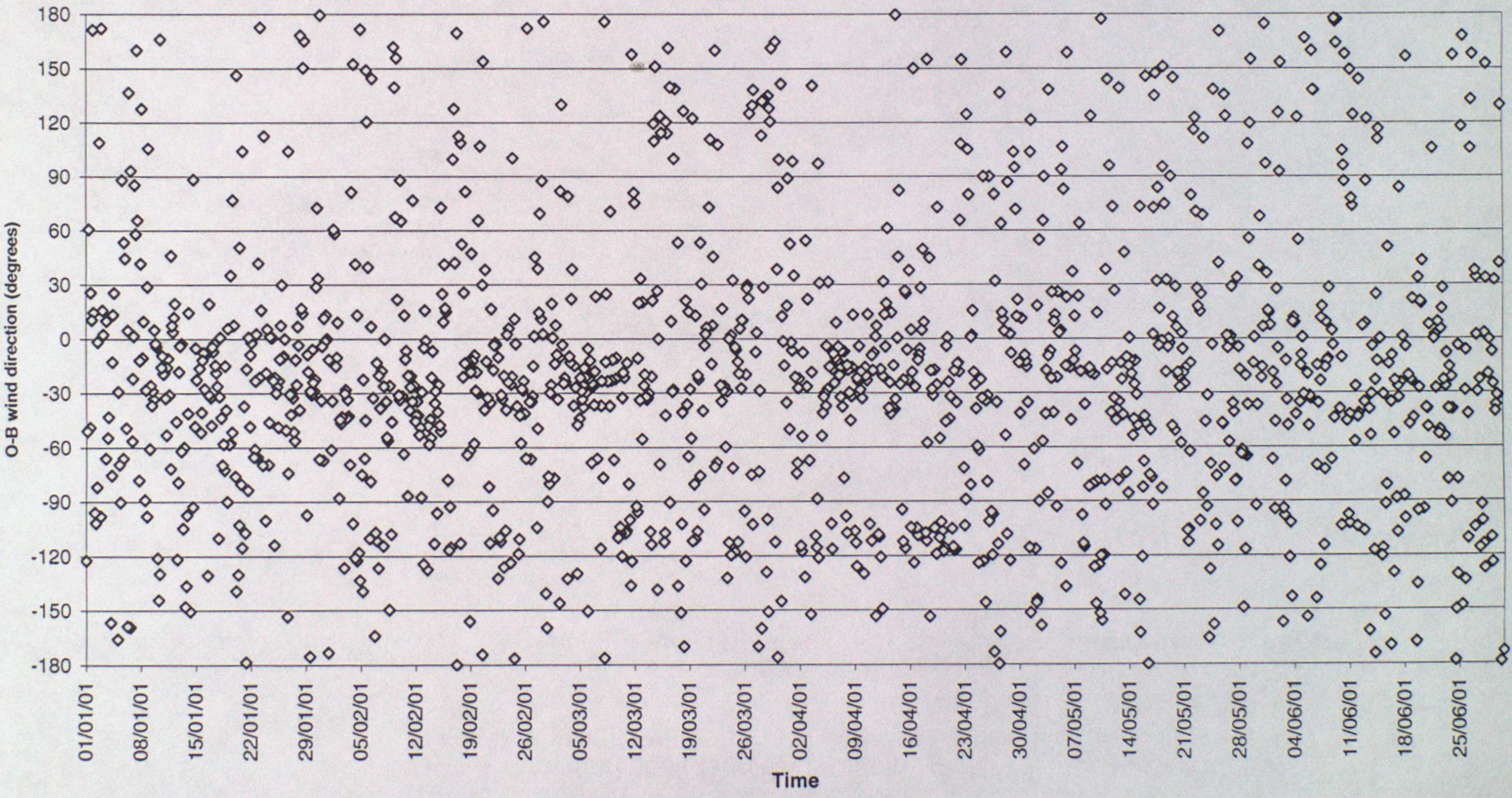


O-B wind direction (degrees) for identifier 41594
Number of obs. plotted = 790    Number of outliers = 0



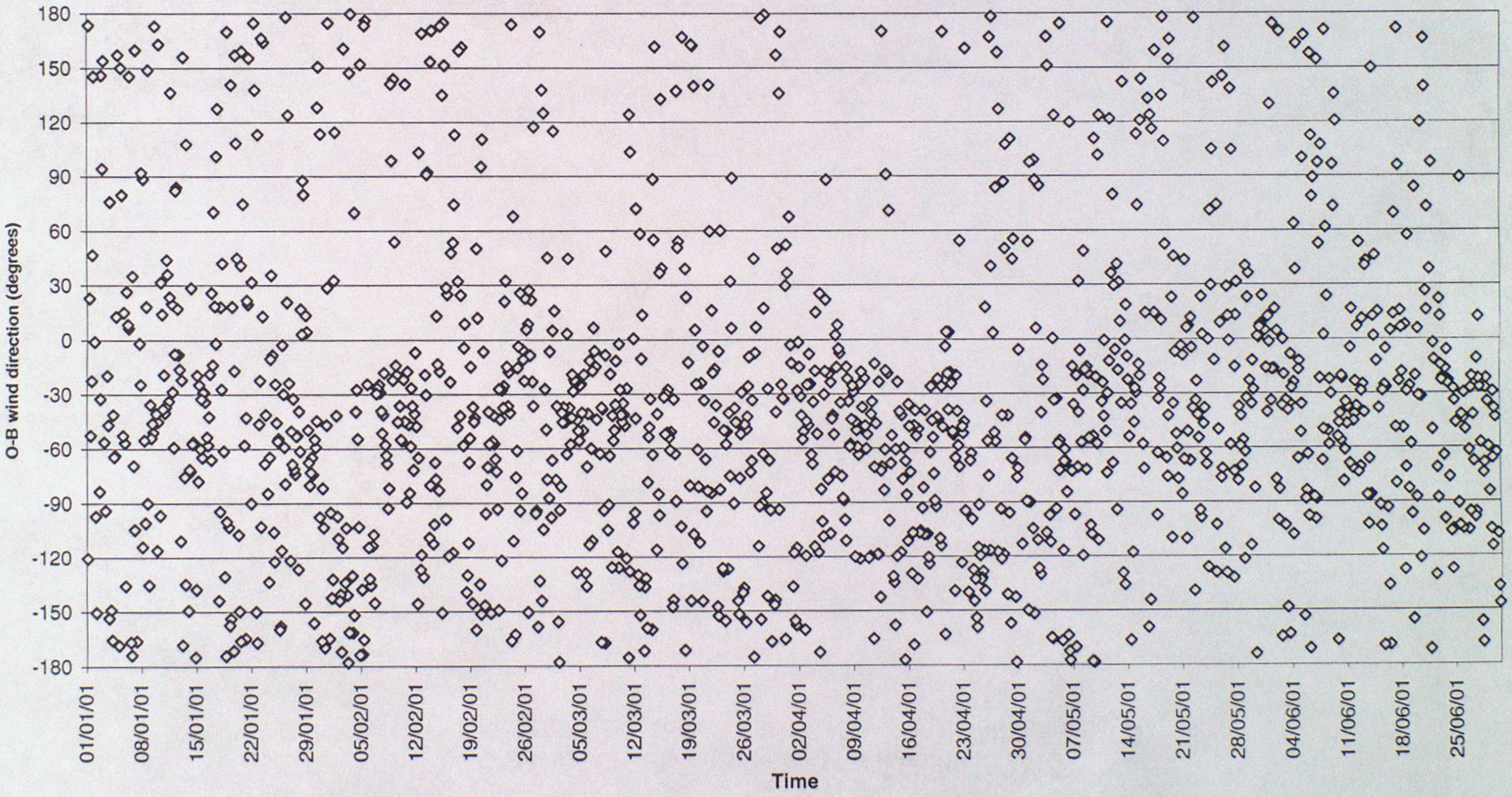


O-B wind direction (degrees) for identifier 41594
Number of obs. plotted = 790    Number of outliers = 0

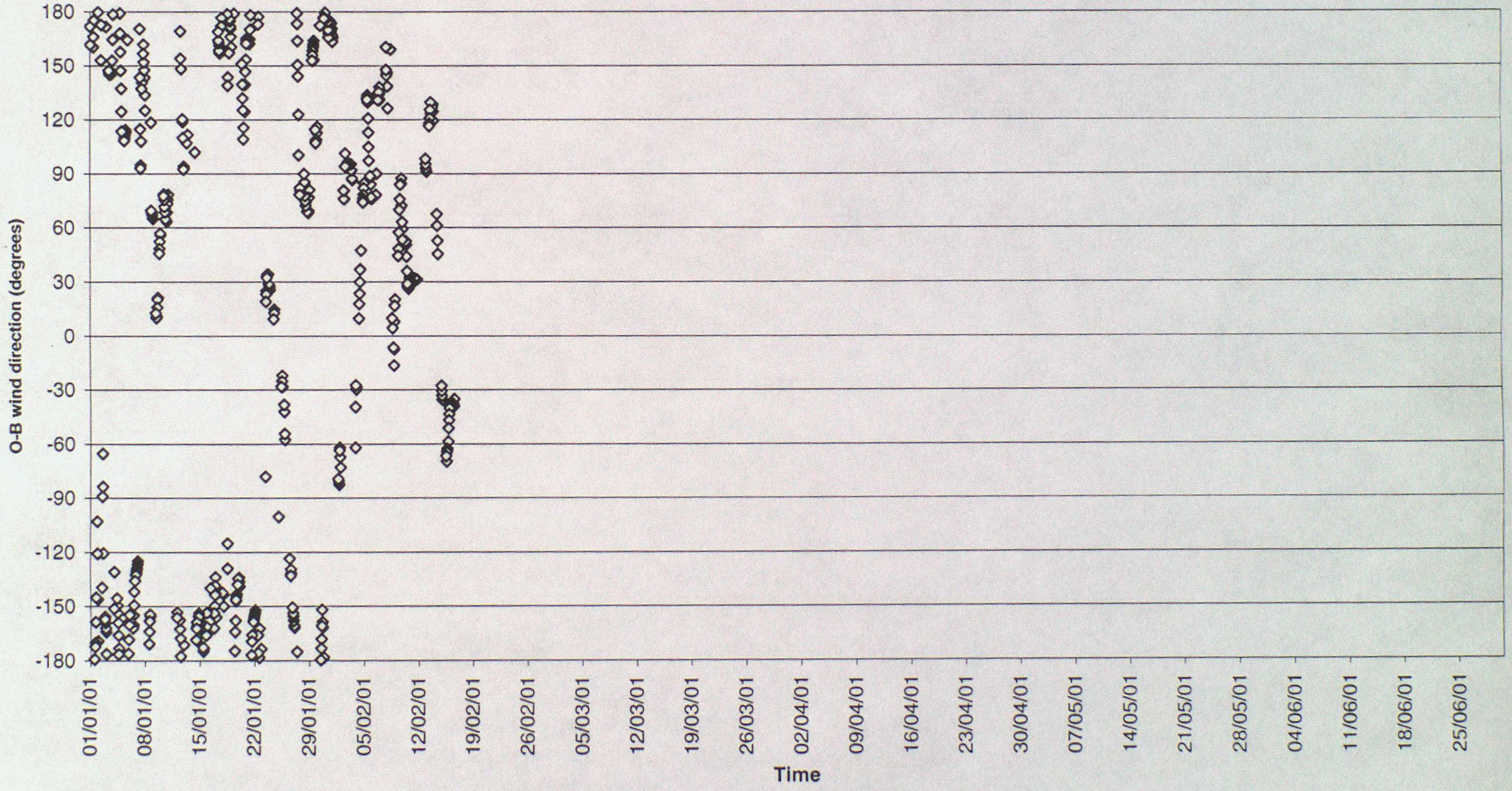


O-B wind direction (degrees) for identifier 46025
Number of obs. plotted = 1348    Number of outliers = 0

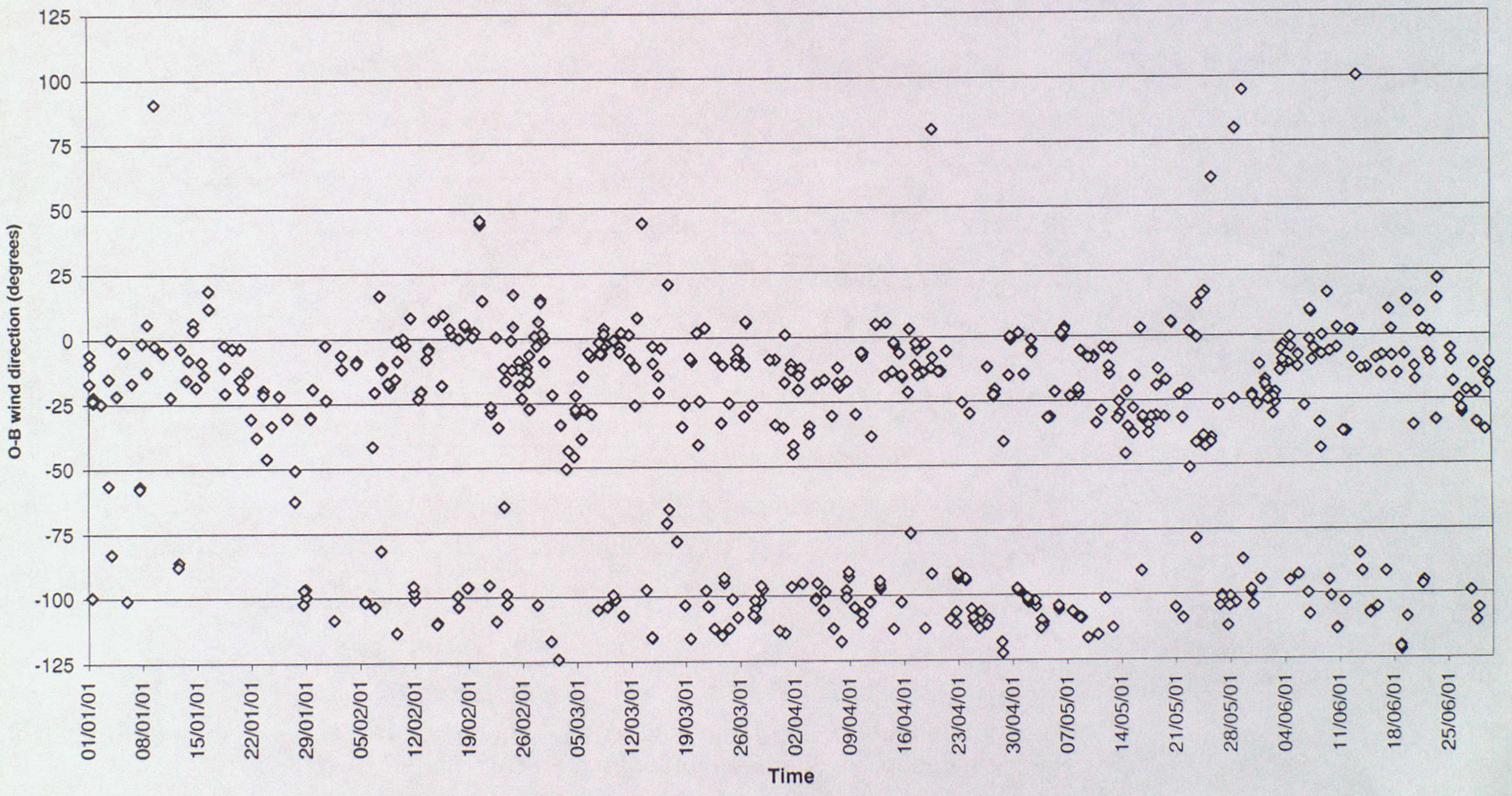
O-B wind direction (degrees) for identifier 46053
Number of obs. plotted = 1367    Number of outliers = 0



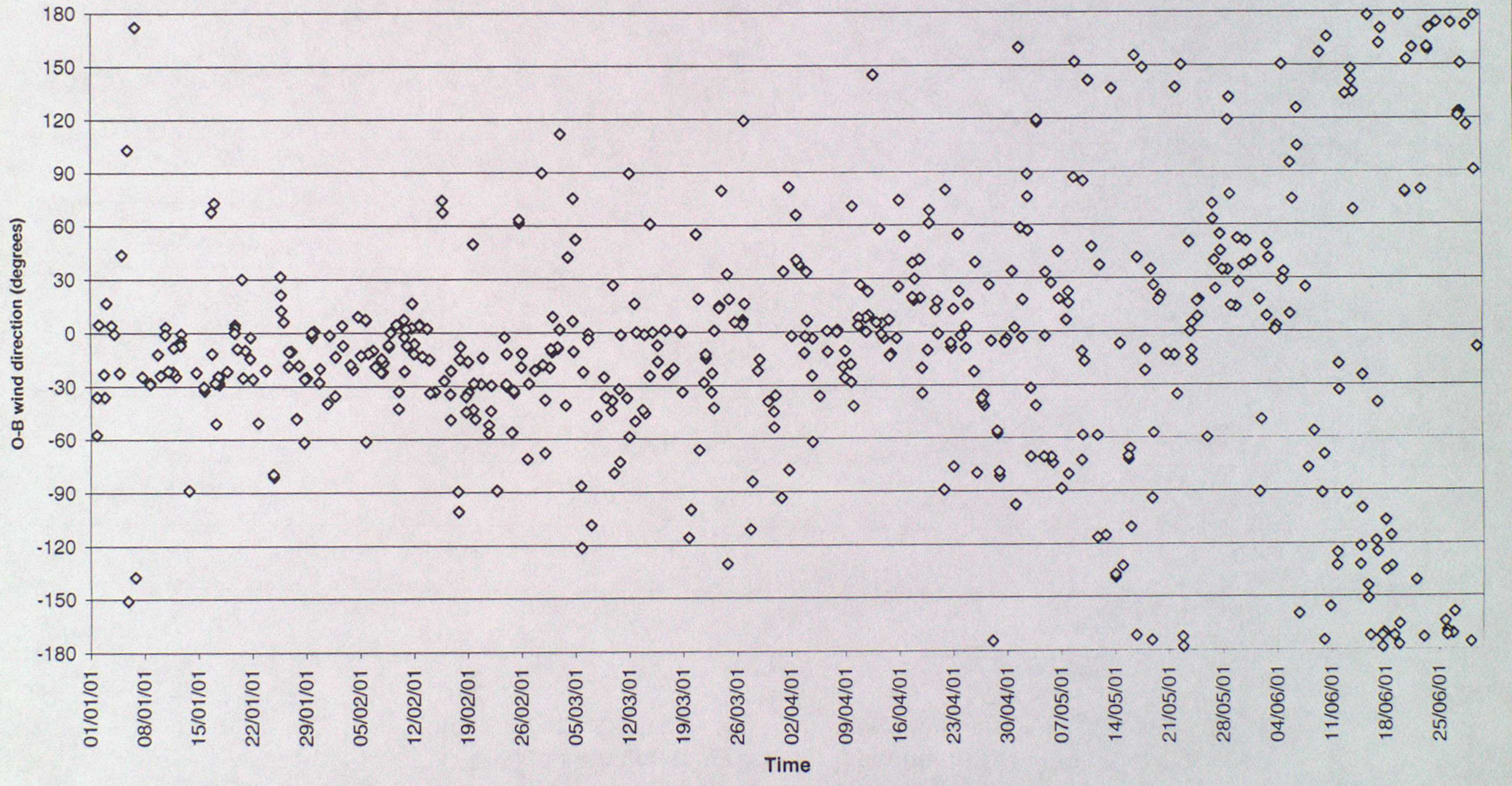
O-B wind direction (degrees) for identifier 46660
Number of obs. plotted = 506    Number of outliers = 0



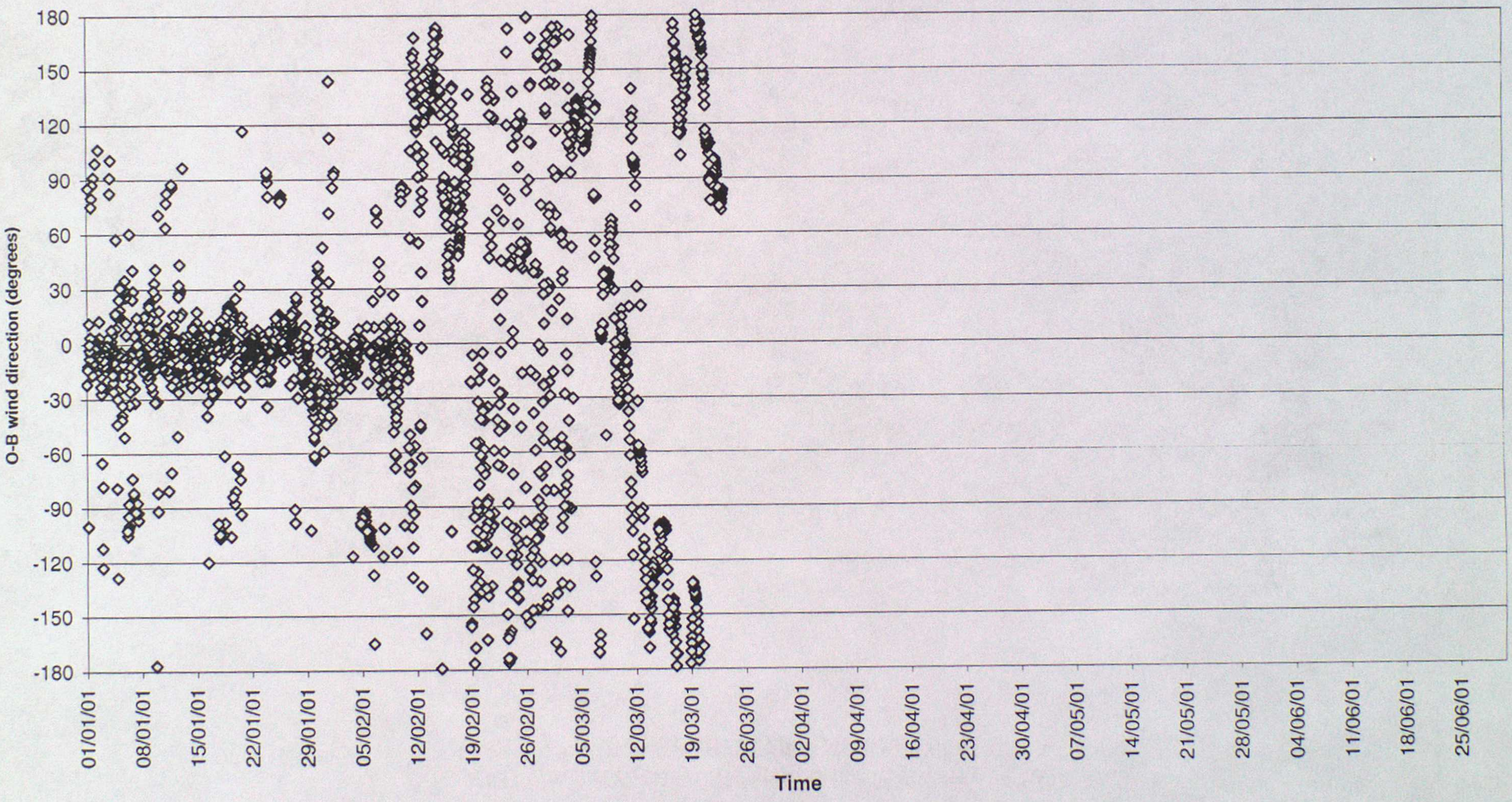
O-B wind direction (degrees) for identifier 51308
Number of obs. plotted = 566    Number of outliers = 0



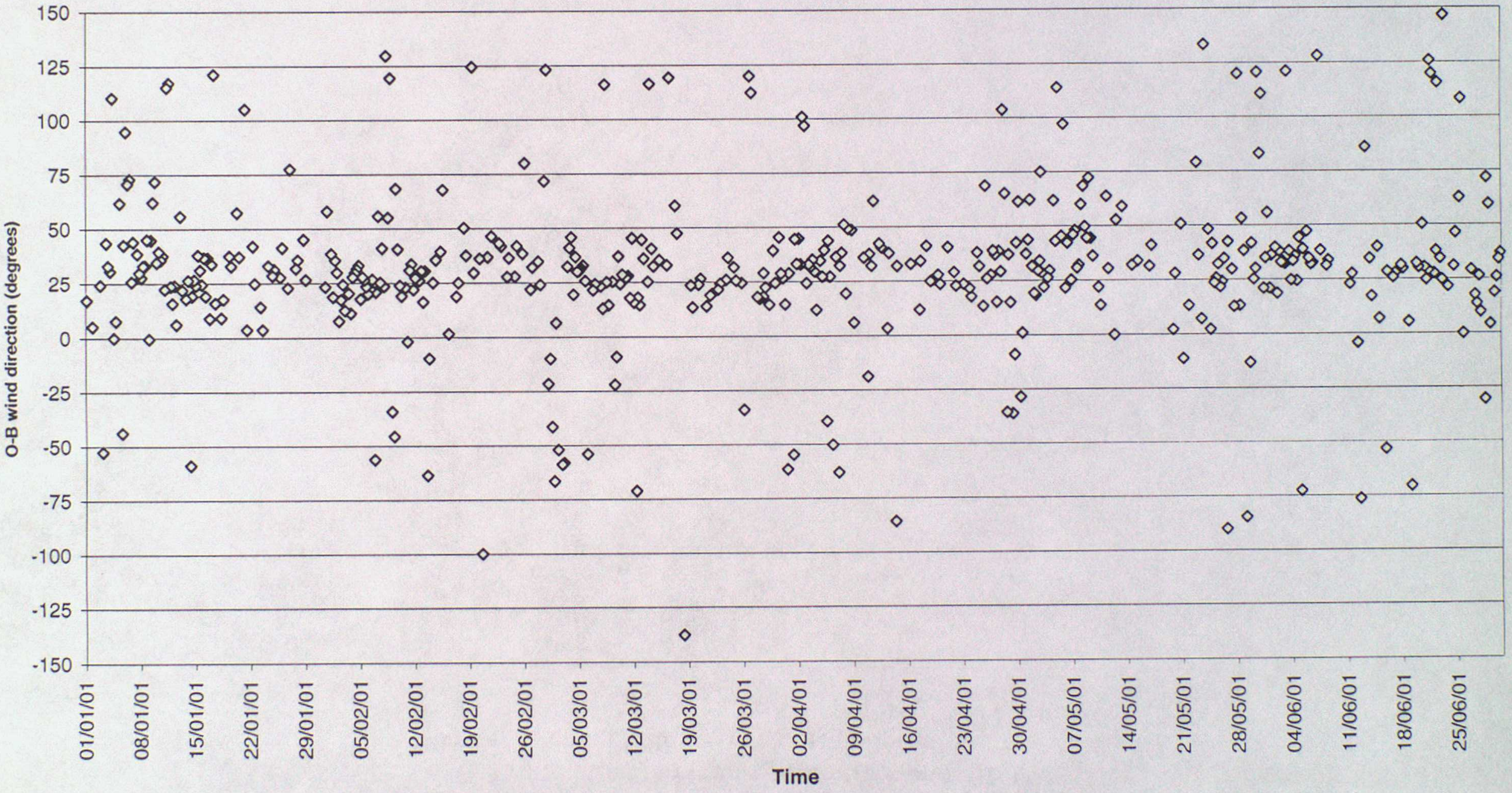
O-B wind direction (degrees) for identifier 52316
Number of obs. plotted = 517    Number of outliers = 0



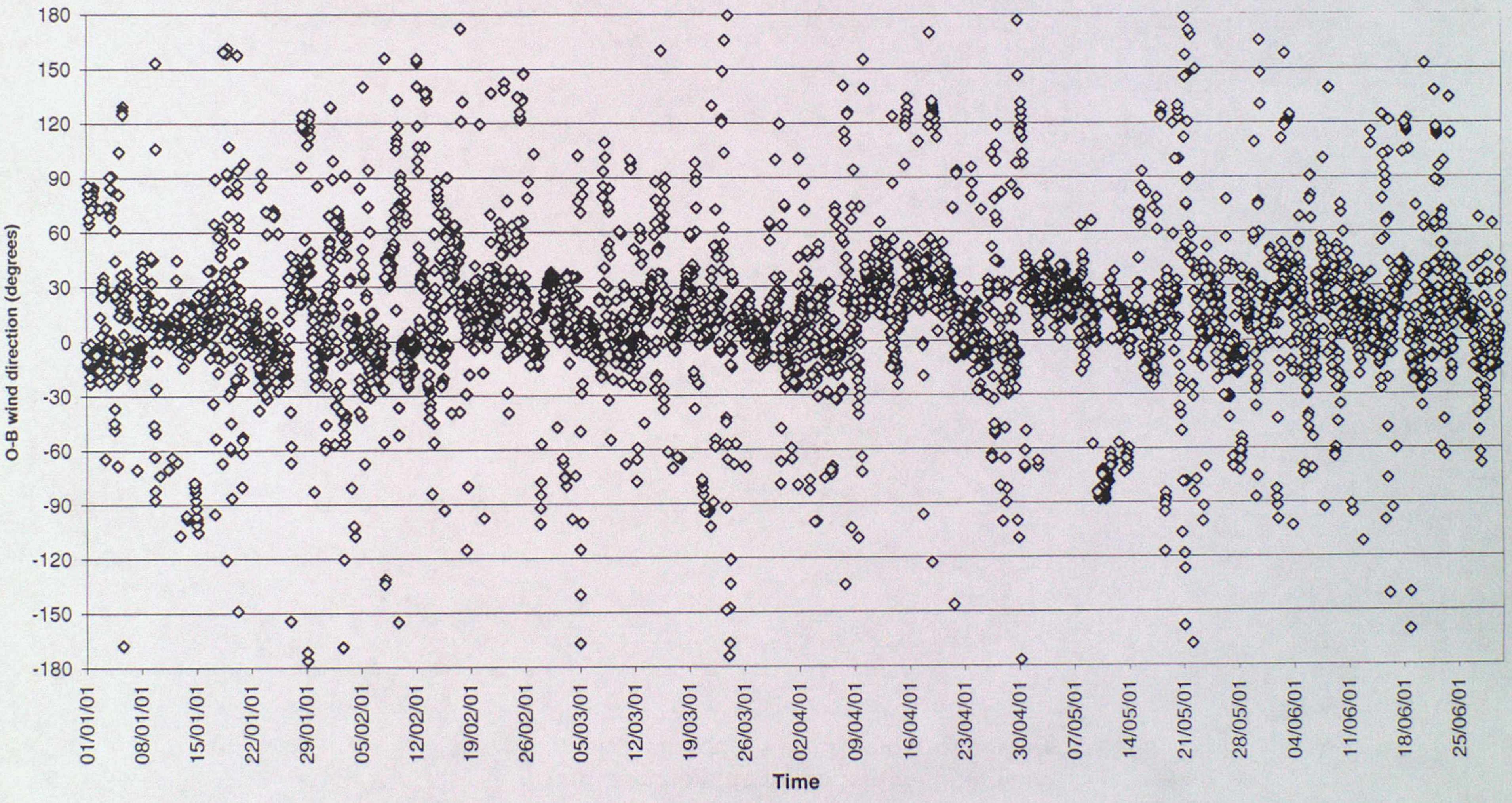
O-B wind direction (degrees) for identifier 62109
Number of obs. plotted = 1894    Number of outliers = 0



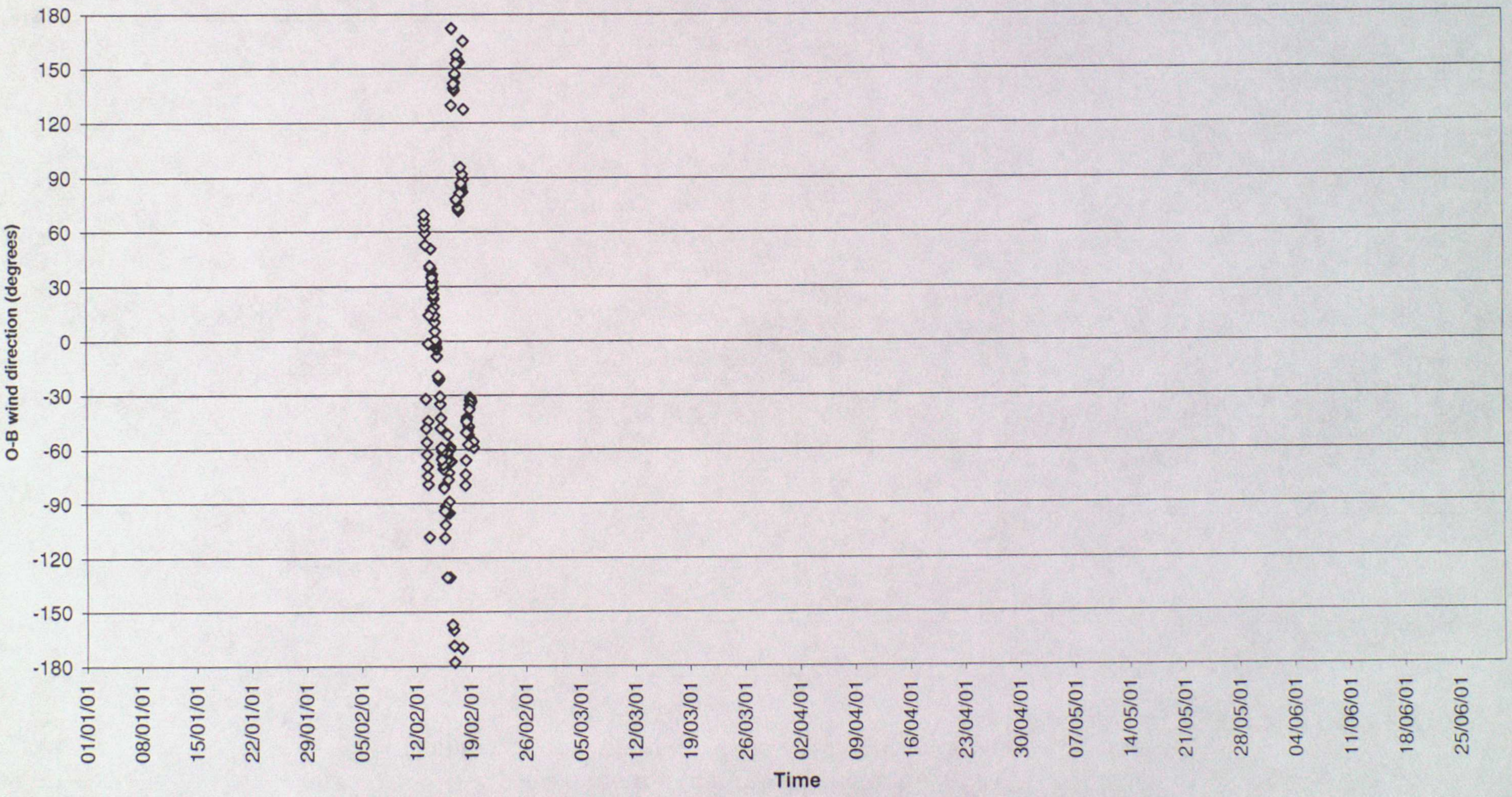
O-B wind direction (degrees) for identifier 62131
Number of obs. plotted = 475    Number of outliers = 5



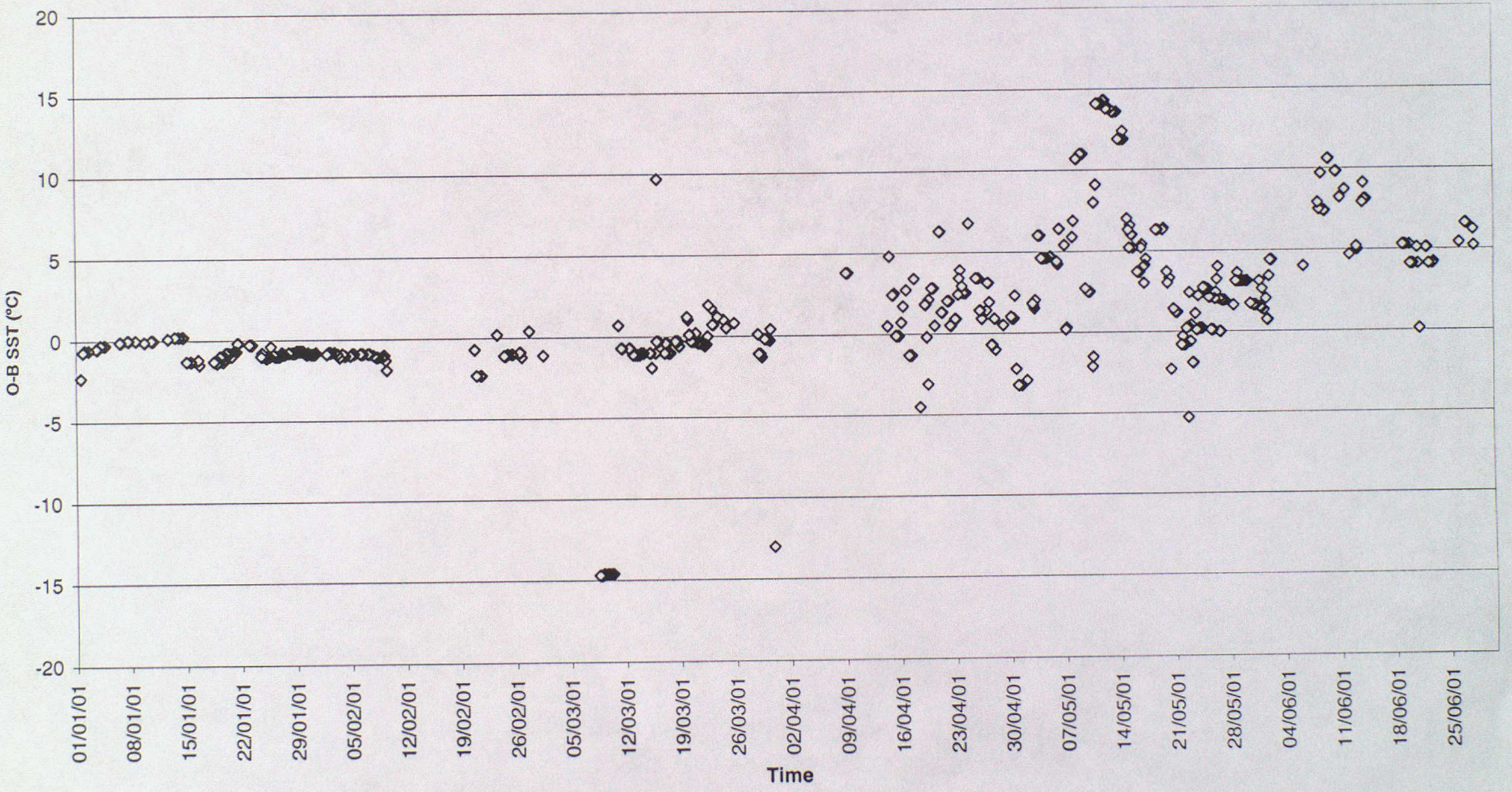
O-B wind direction (degrees) for identifier 62144
Number of obs. plotted = 4200    Number of outliers = 0



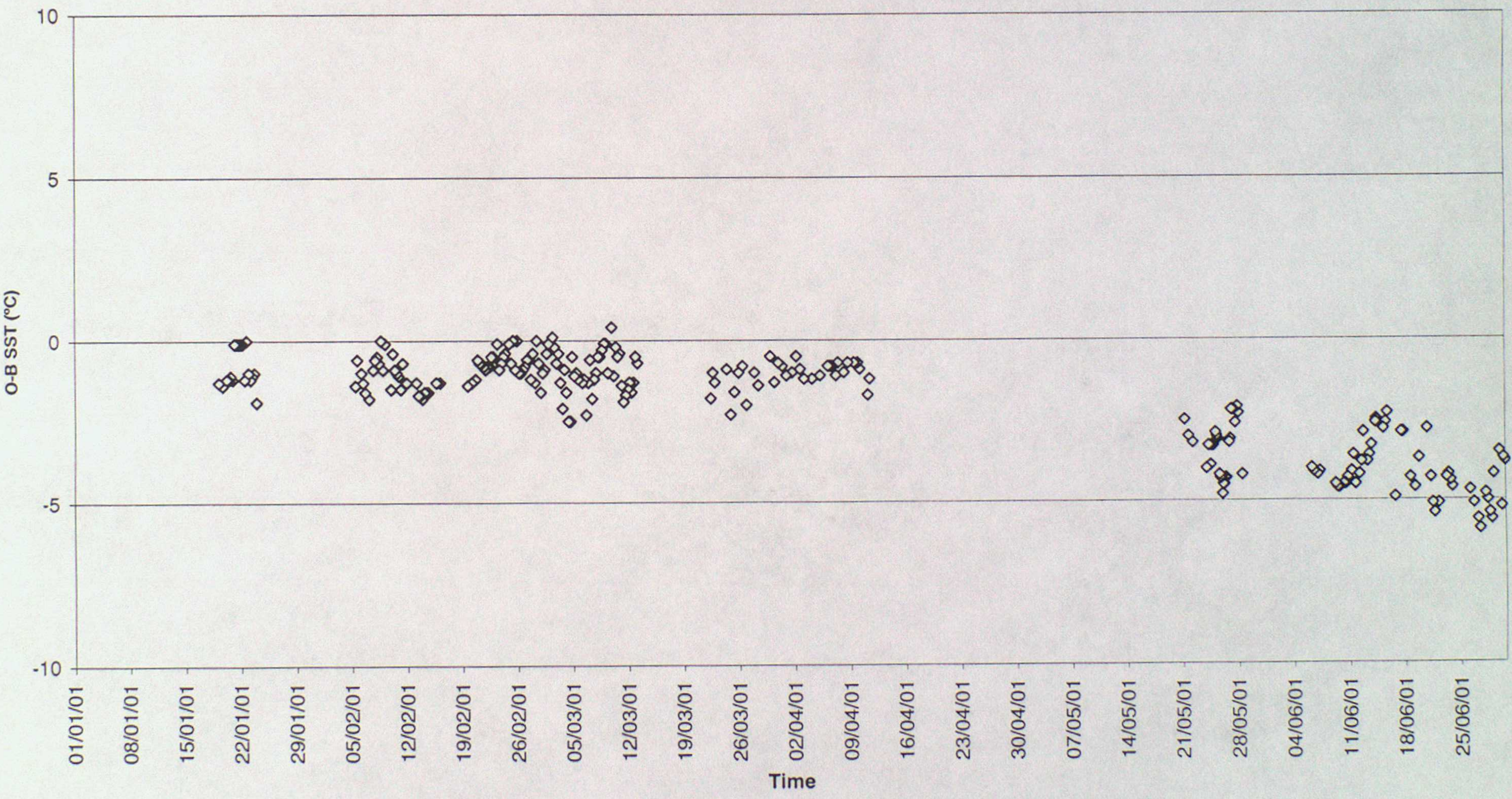
O-B wind direction (degrees) for identifier 62561
Number of obs. plotted = 135    Number of outliers = 0



O-B SST (°C) for identifier CG2960
Number of obs. plotted = 505    Number of outliers = 0

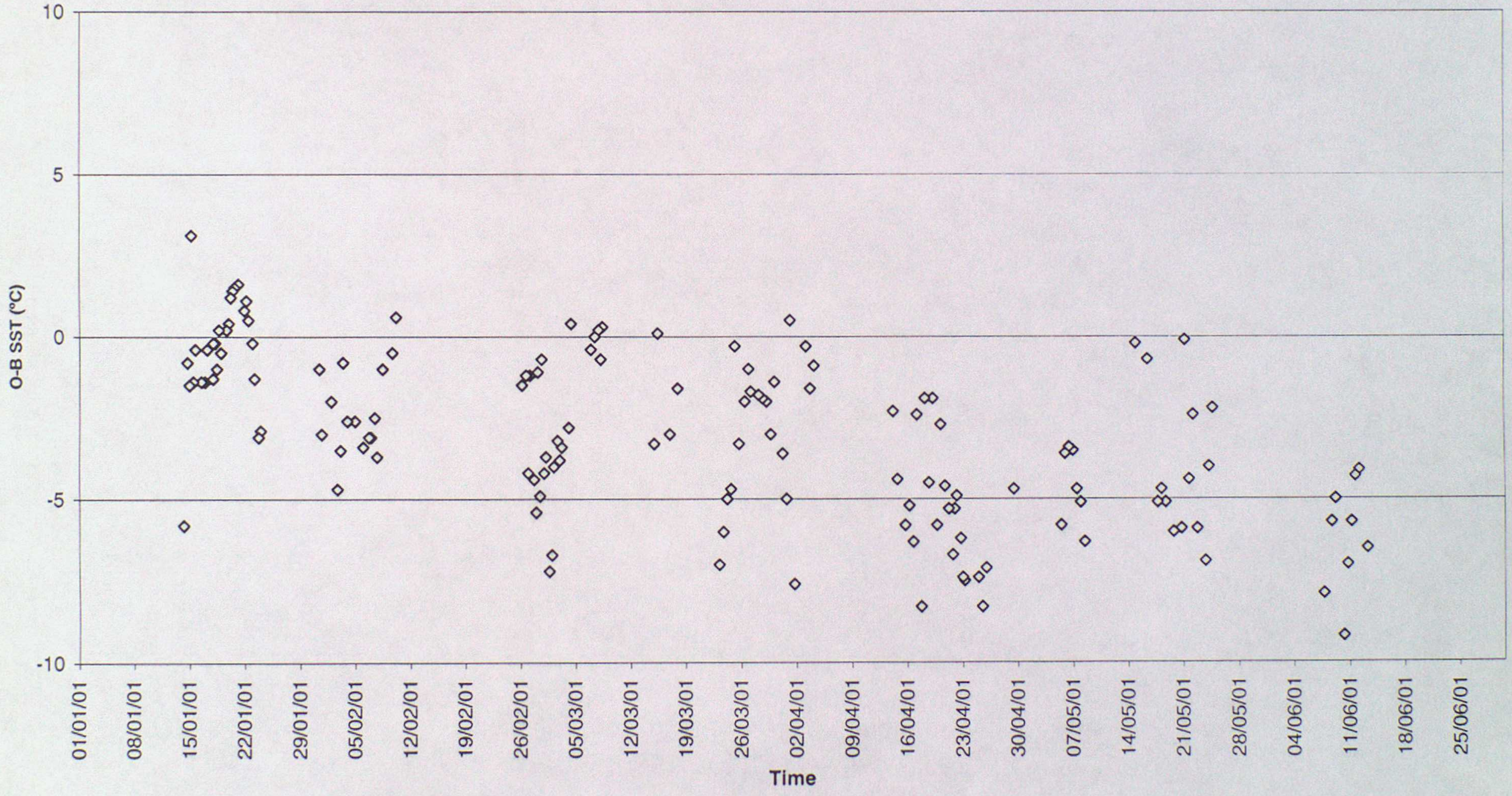


O-B SST (°C) for identifier C6FD8
Number of obs. plotted = 243    Number of outliers = 0

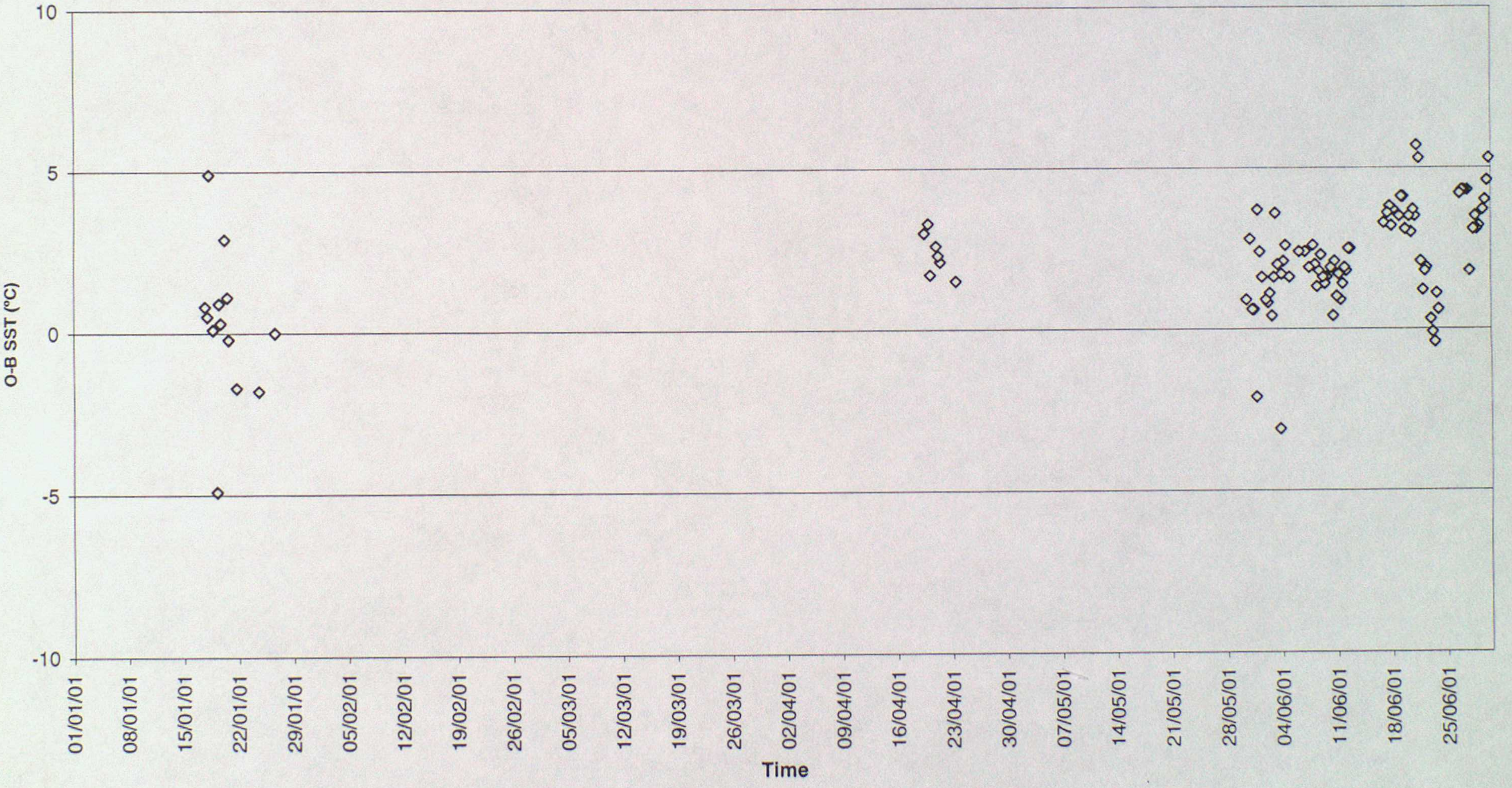


O-B SST (°C) for identifier C6HS4

Number of obs. plotted = 147    Number of outliers = 3

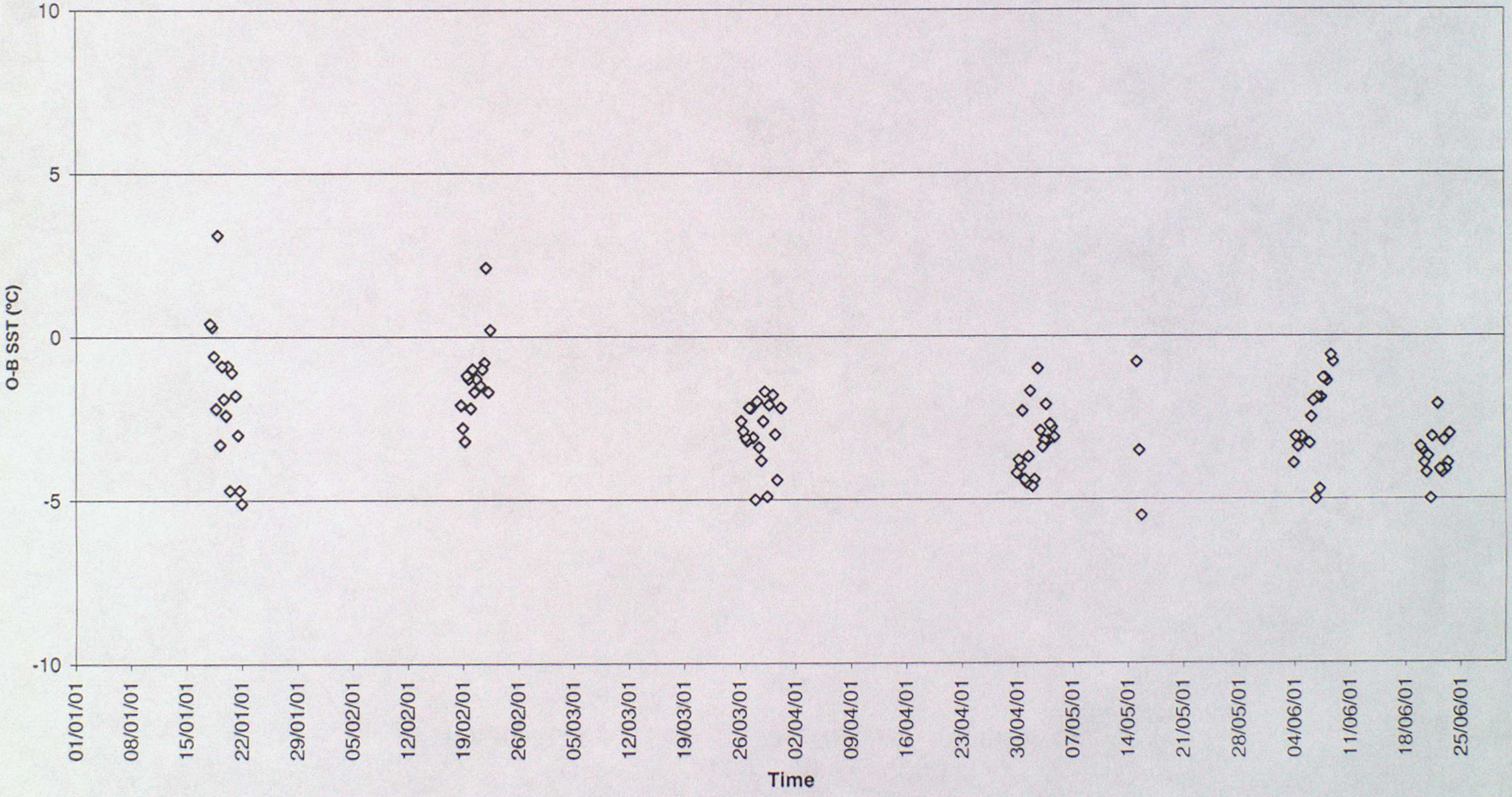


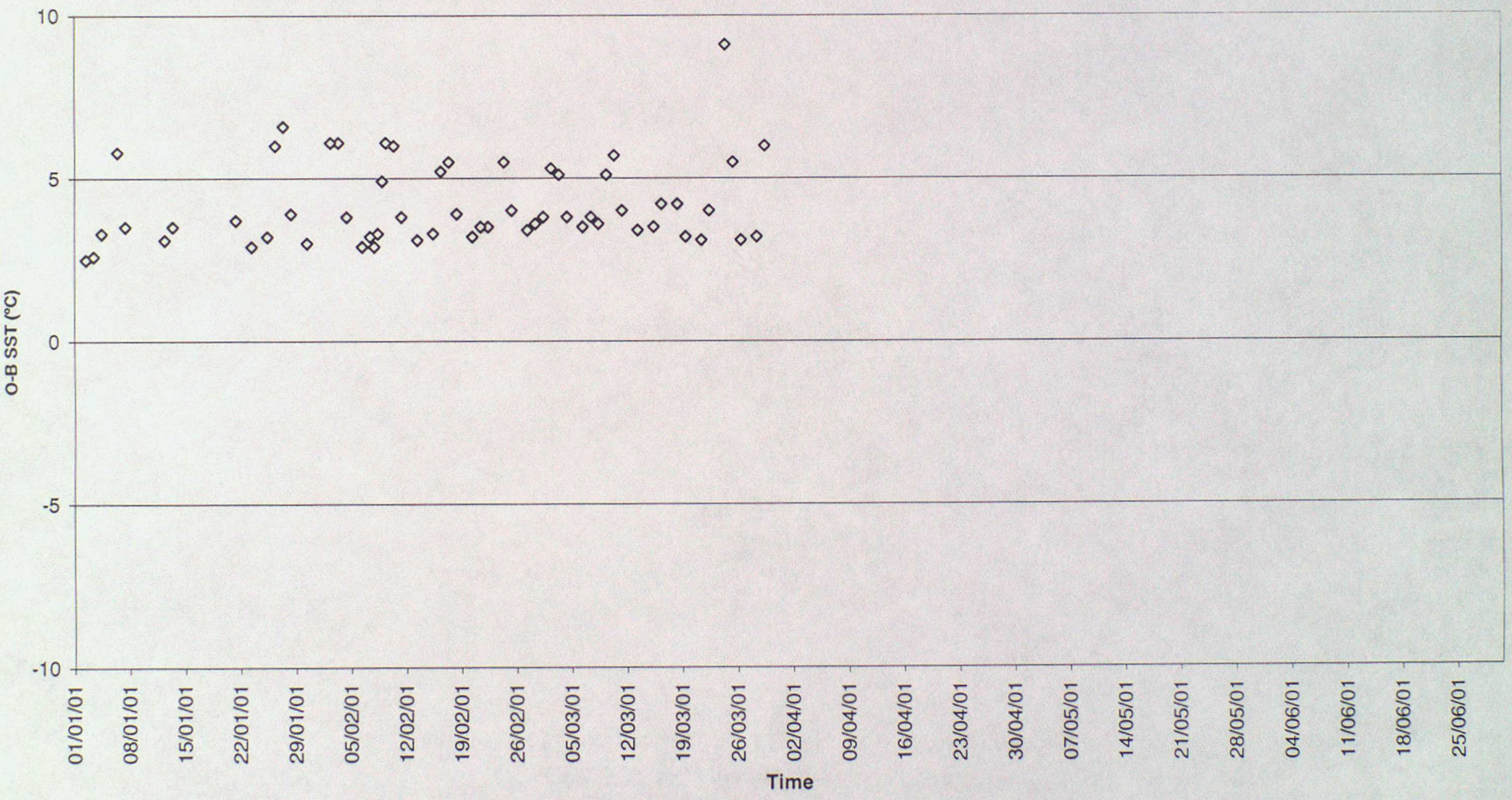
O-B SST (°C) for identifier C6IZ7
Number of obs. plotted = 99    Number of outliers = 0



## O-B SST (°C) for identifier C6MS4

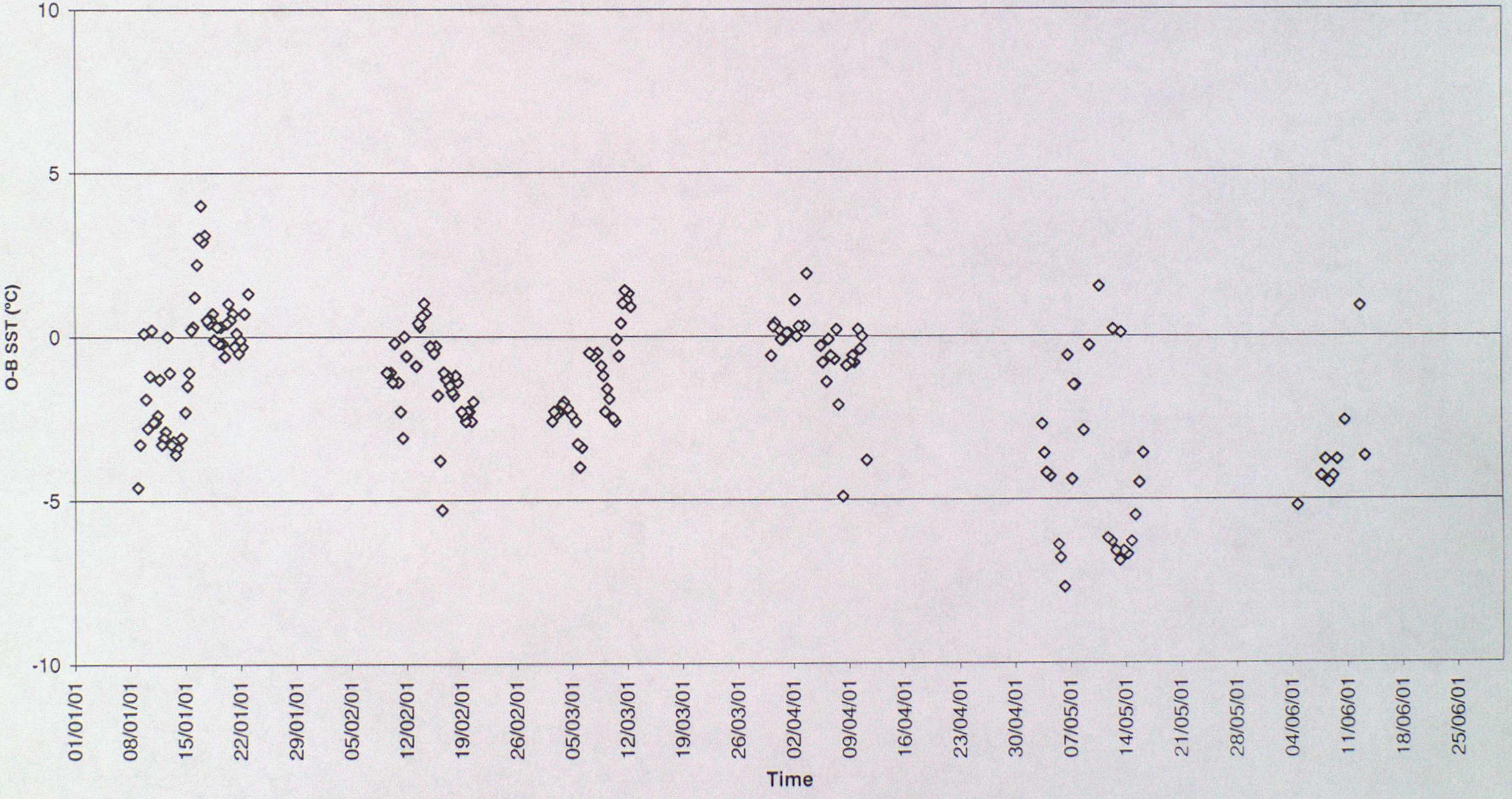
Number of obs. plotted = 102    Number of outliers = 2

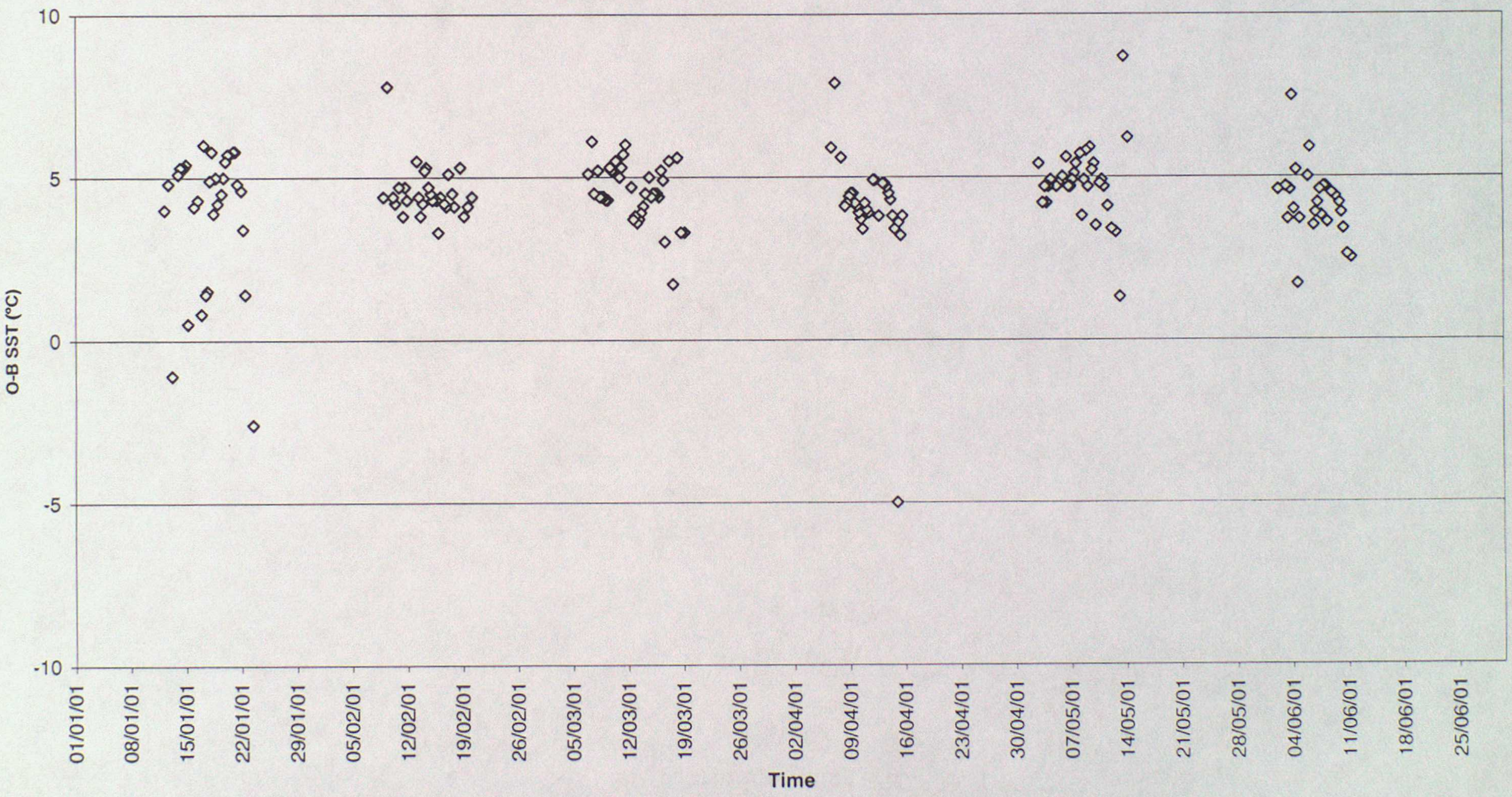




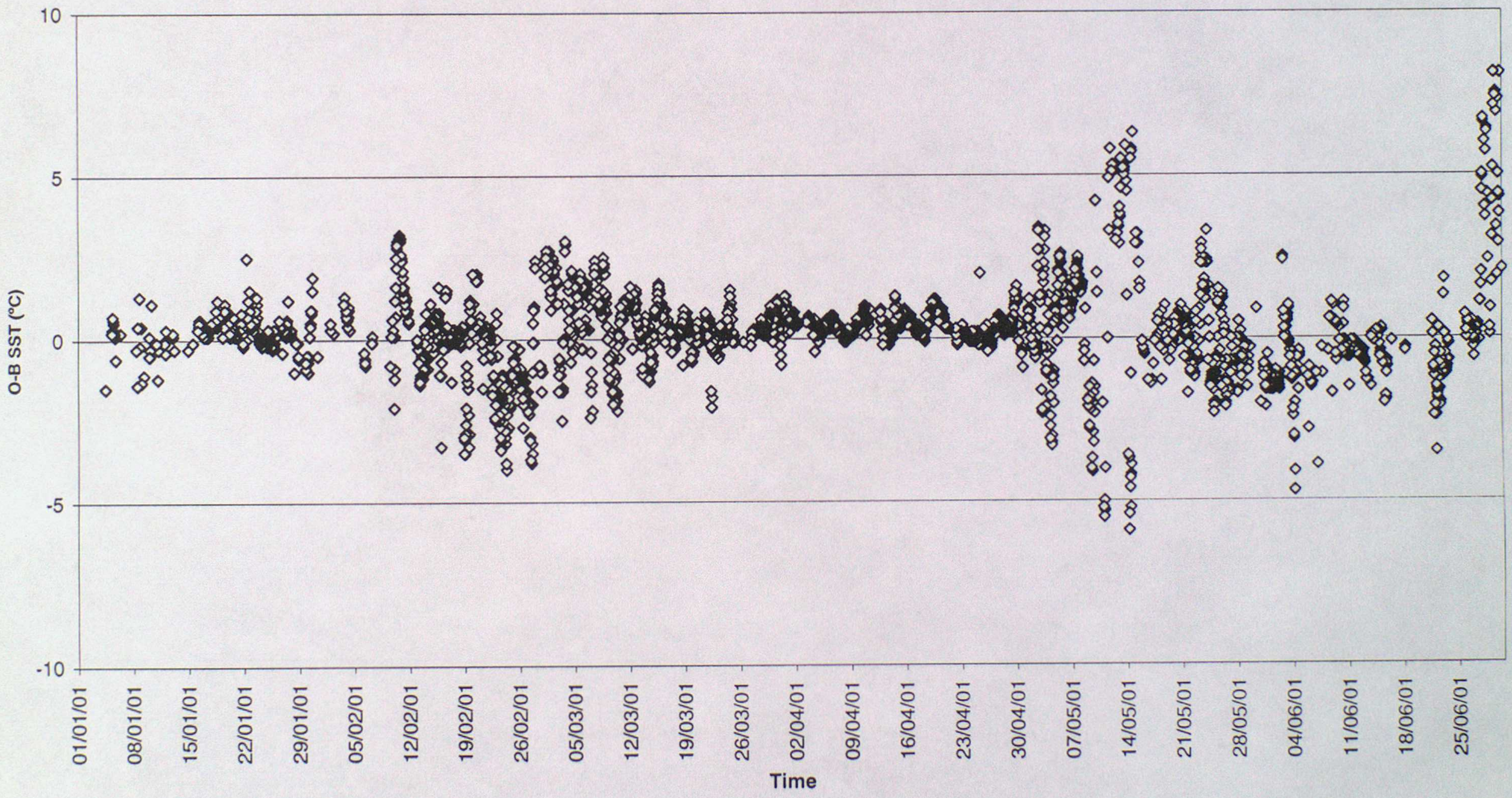
O-B SST (°C) for identifier C6MX4
Number of obs. plotted = 59    Number of outliers = 0

O-B SST (°C) for identifier C6OM7
Number of obs. plotted = 185    Number of outliers = 2

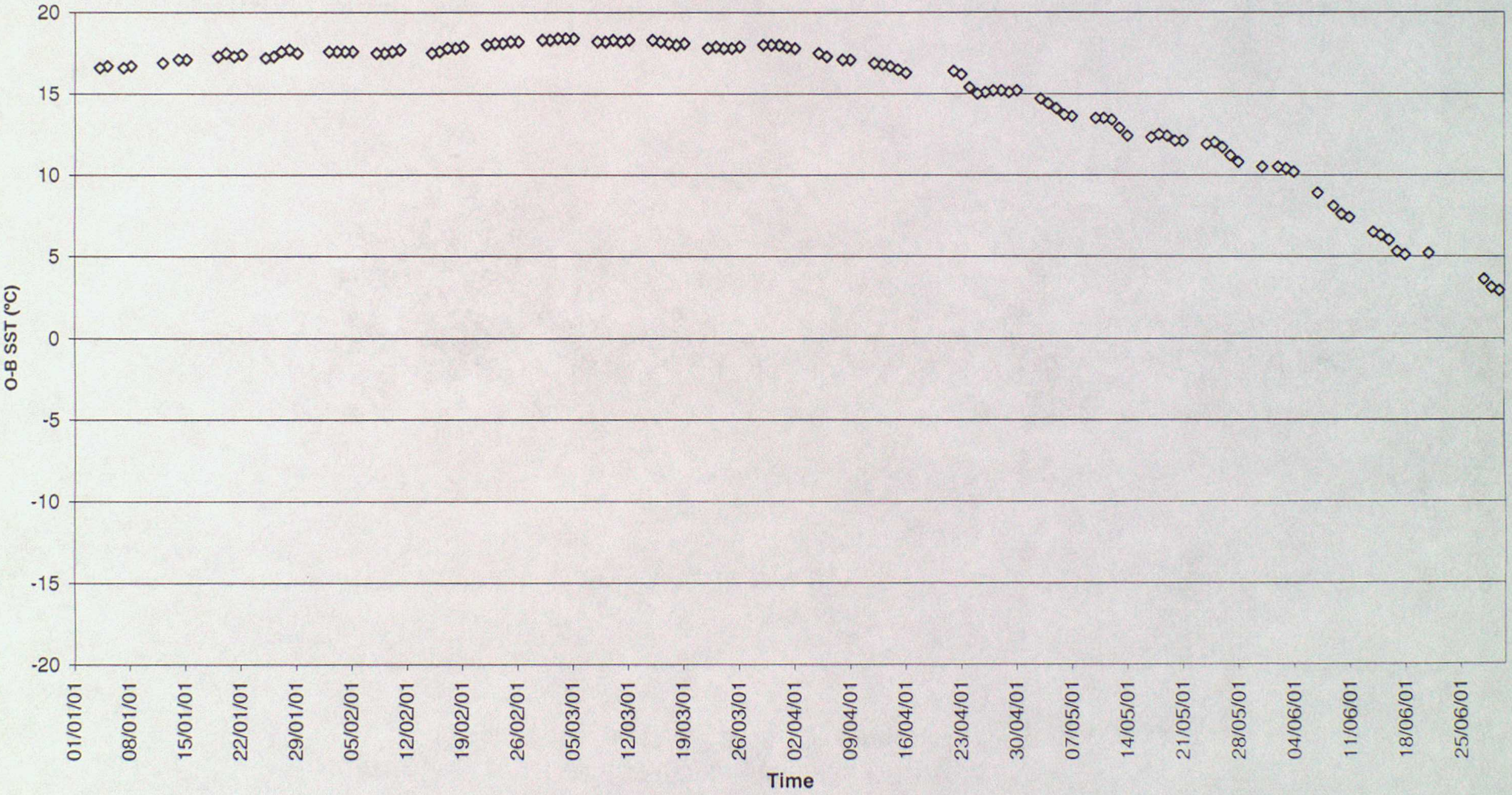



O-B SST (°C) for identifier C6OQ8
Number of obs. plotted = 187    Number of outliers = 0

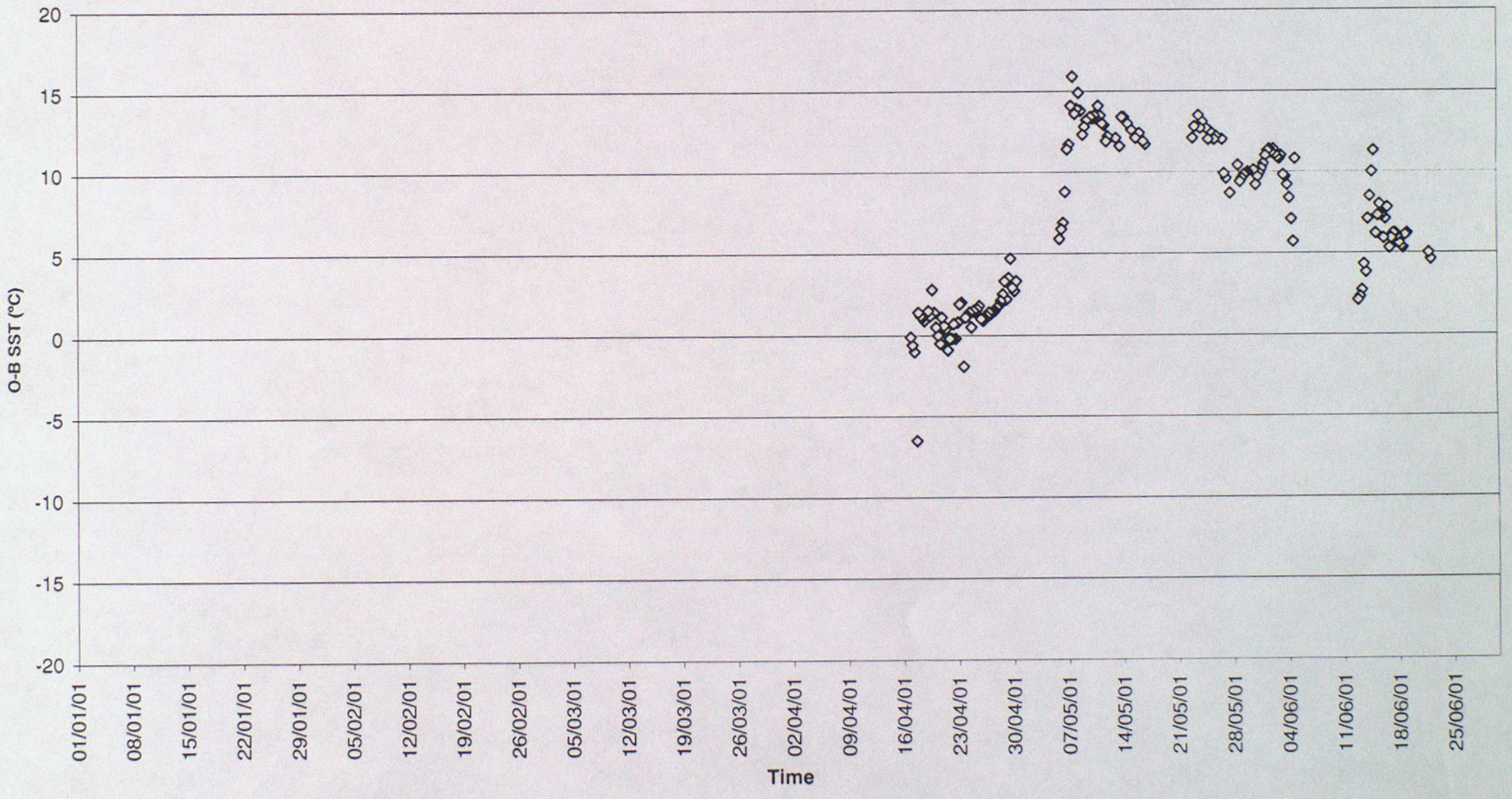
O-B SST (°C) for identifier DBBH
Number of obs. plotted = 2556    Number of outliers = 5



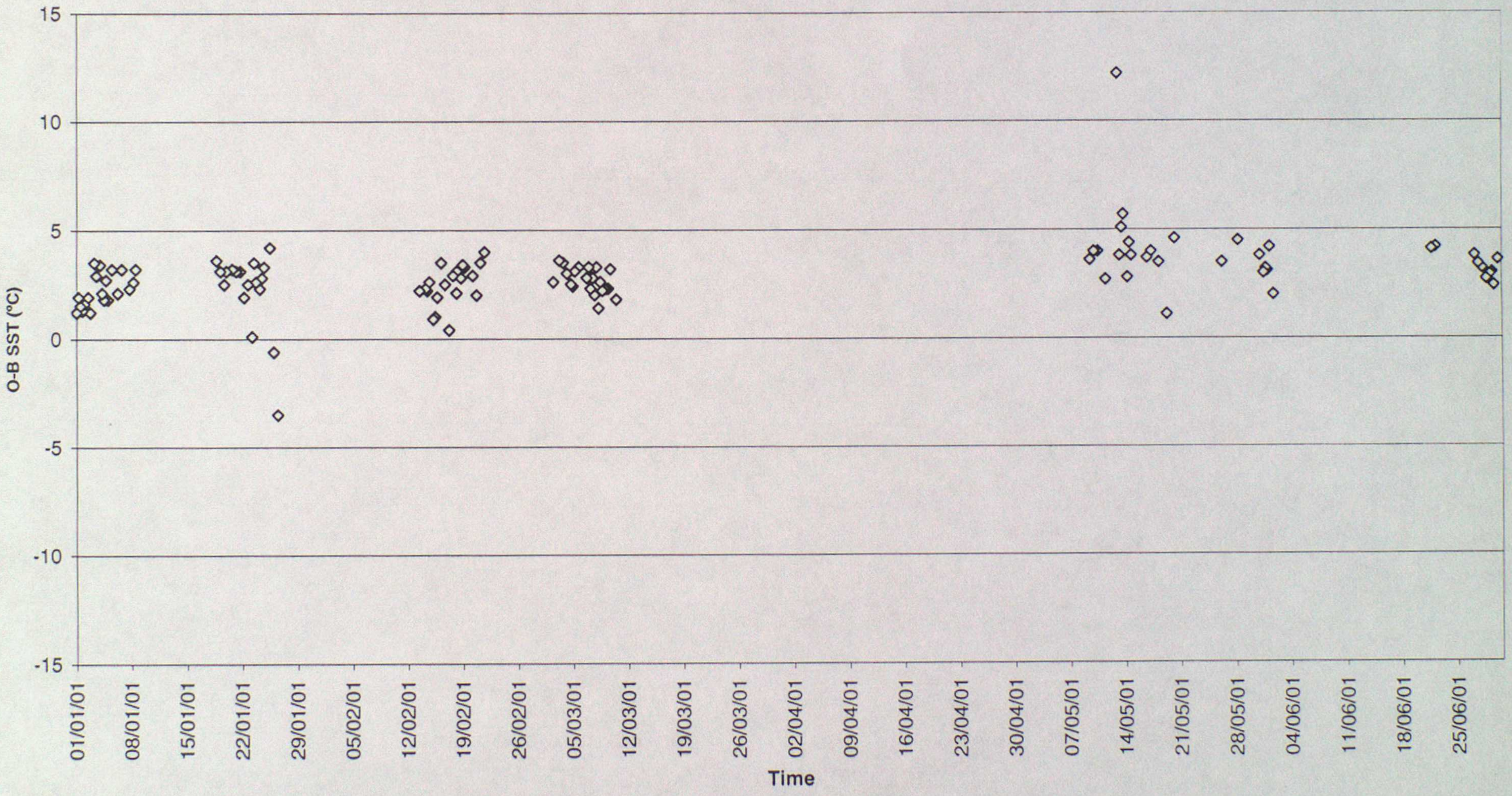
O-B SST (°C) for identifier ELGN6
Number of obs. plotted = 114    Number of outliers = 0



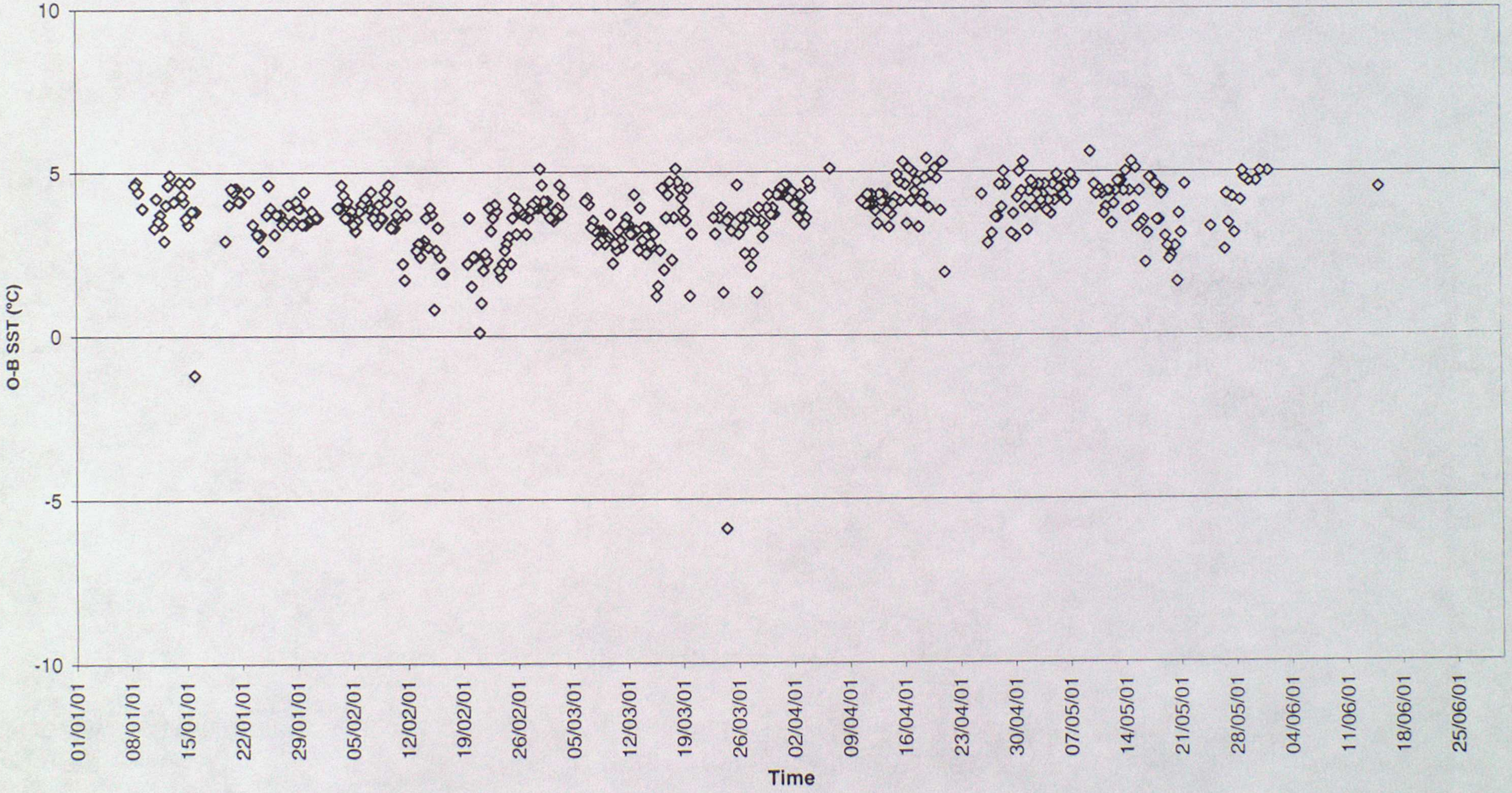
## O-B SST (°C) for identifier ELJL8
Number of obs. plotted = 159    Number of outliers = 0



## O-B SST (ºC) for identifier ELKU8
Number of obs. plotted = 115    Number of outliers = 0

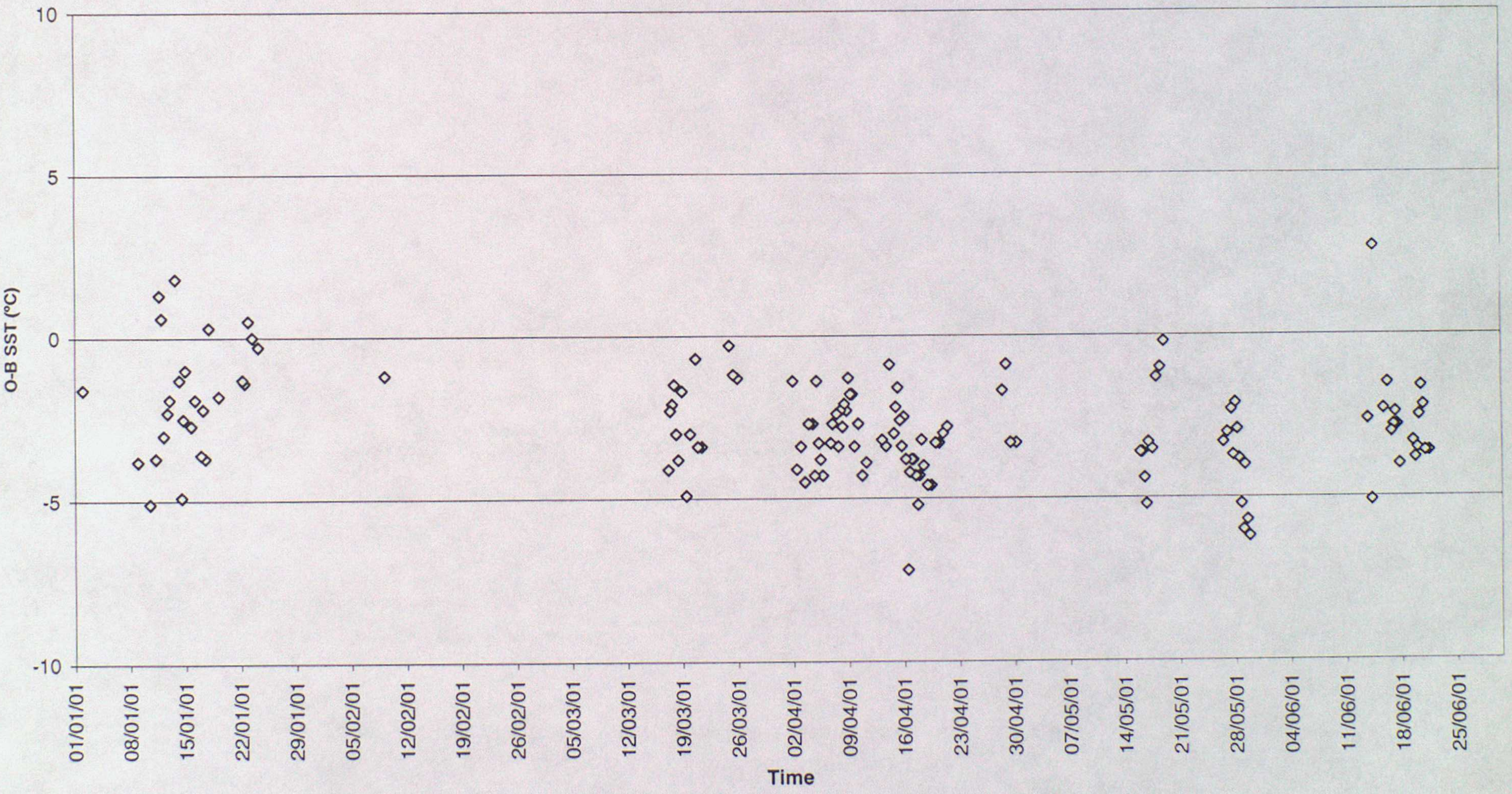


O-B SST (ºC) for identifier ELPQ9
Number of obs. plotted = 401    Number of outliers = 0

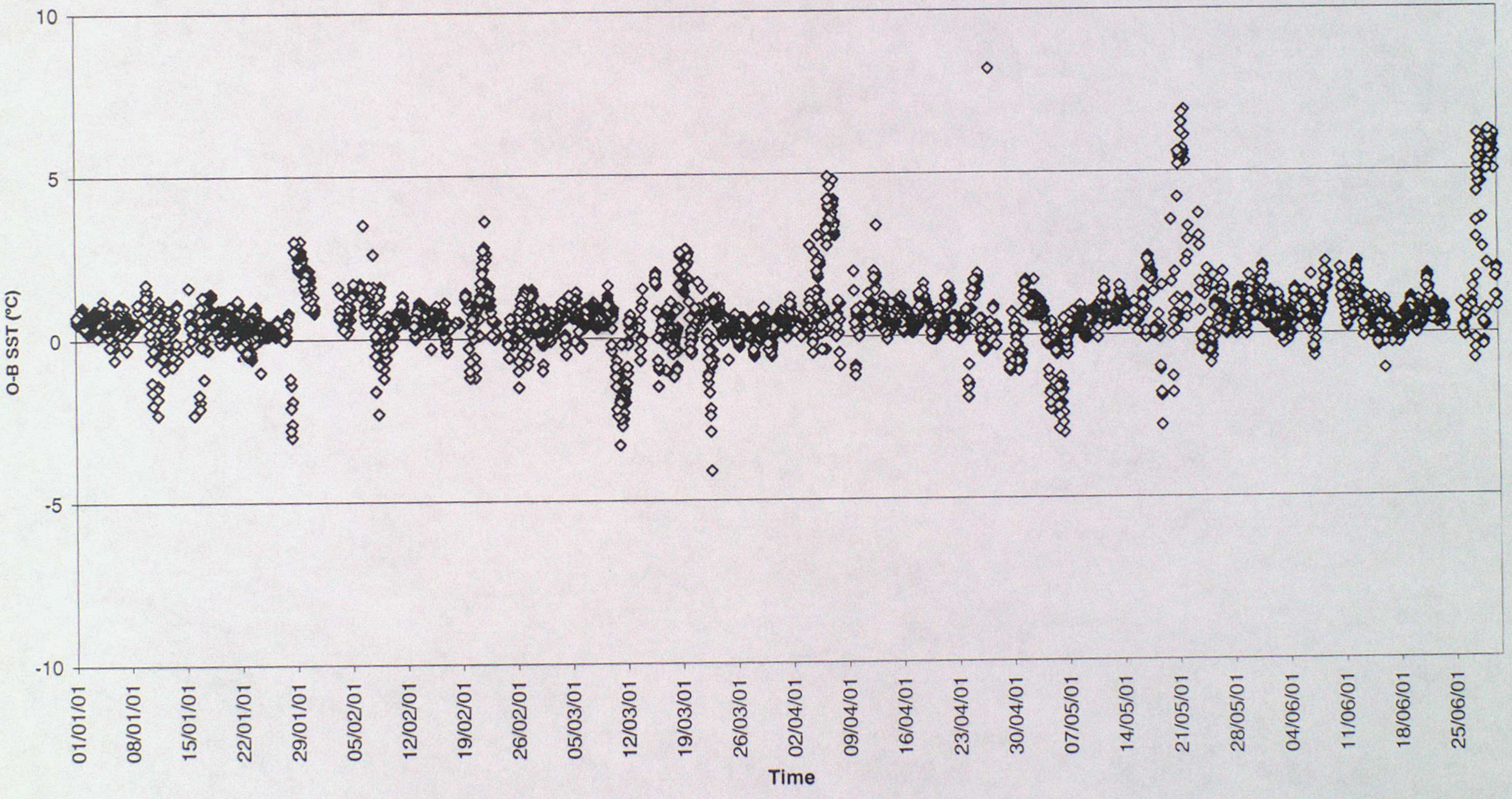


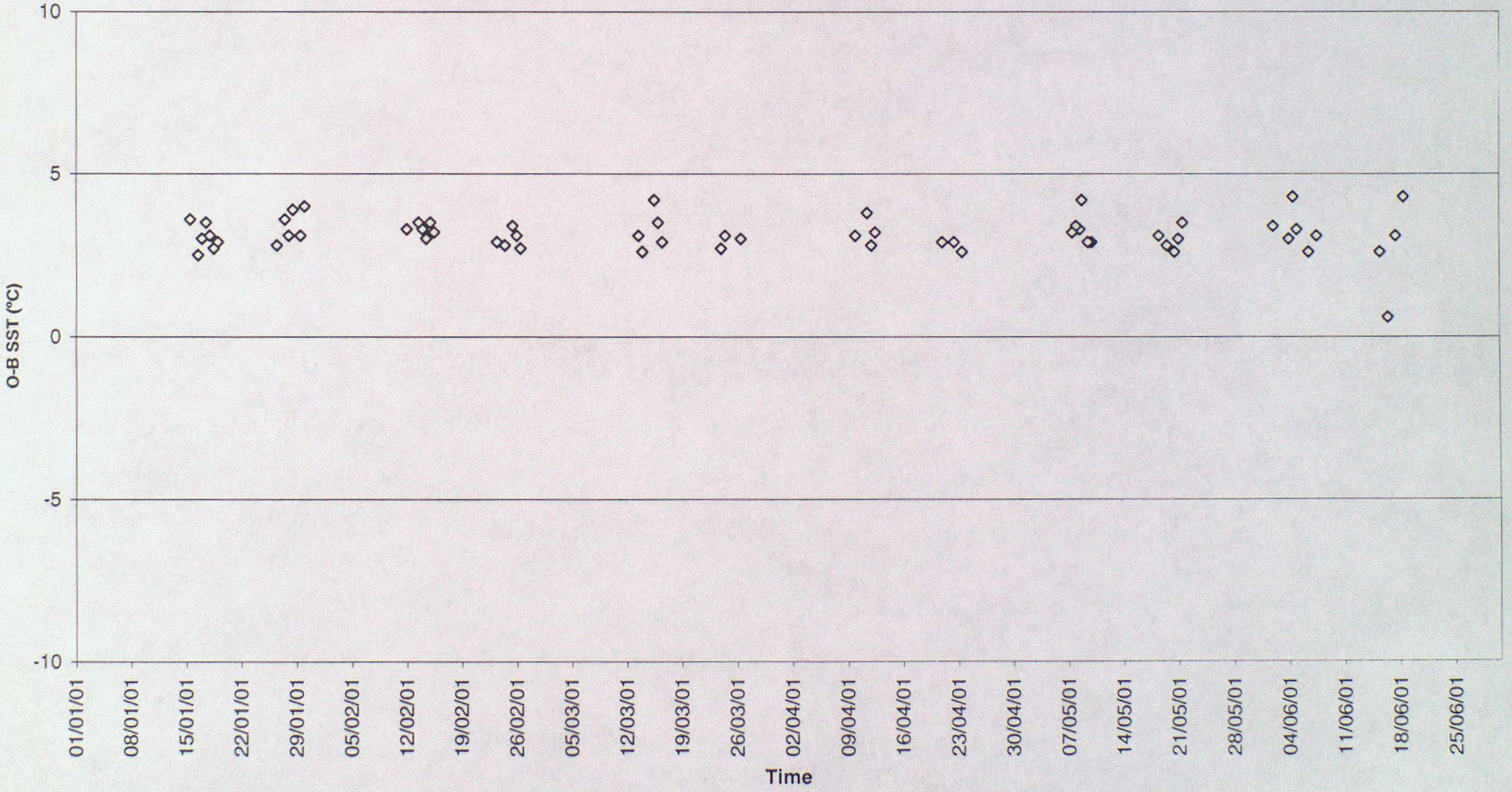
## O-B SST (°C) for identifier ELWB8

Number of obs. plotted = 136    Number of outliers = 0

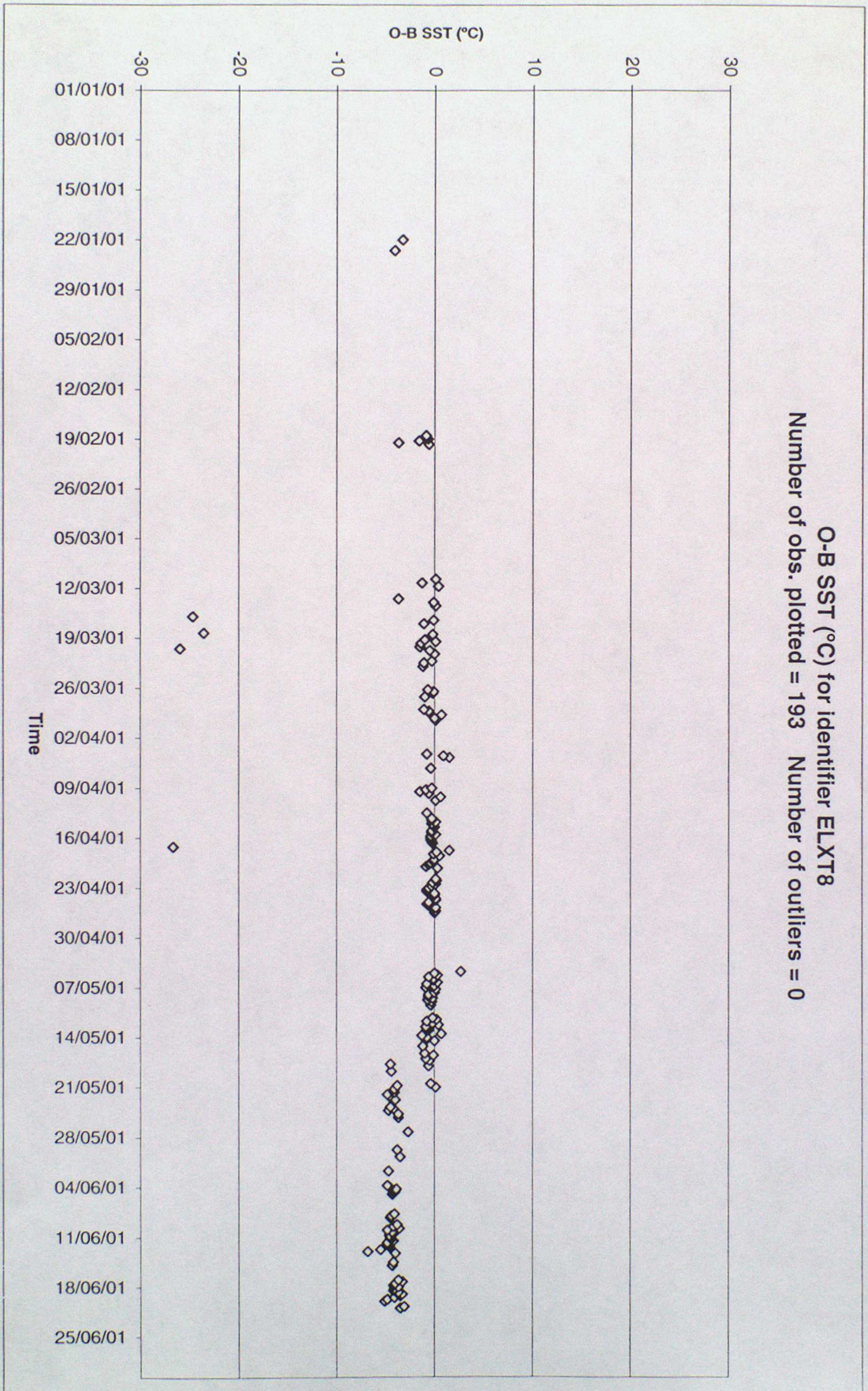


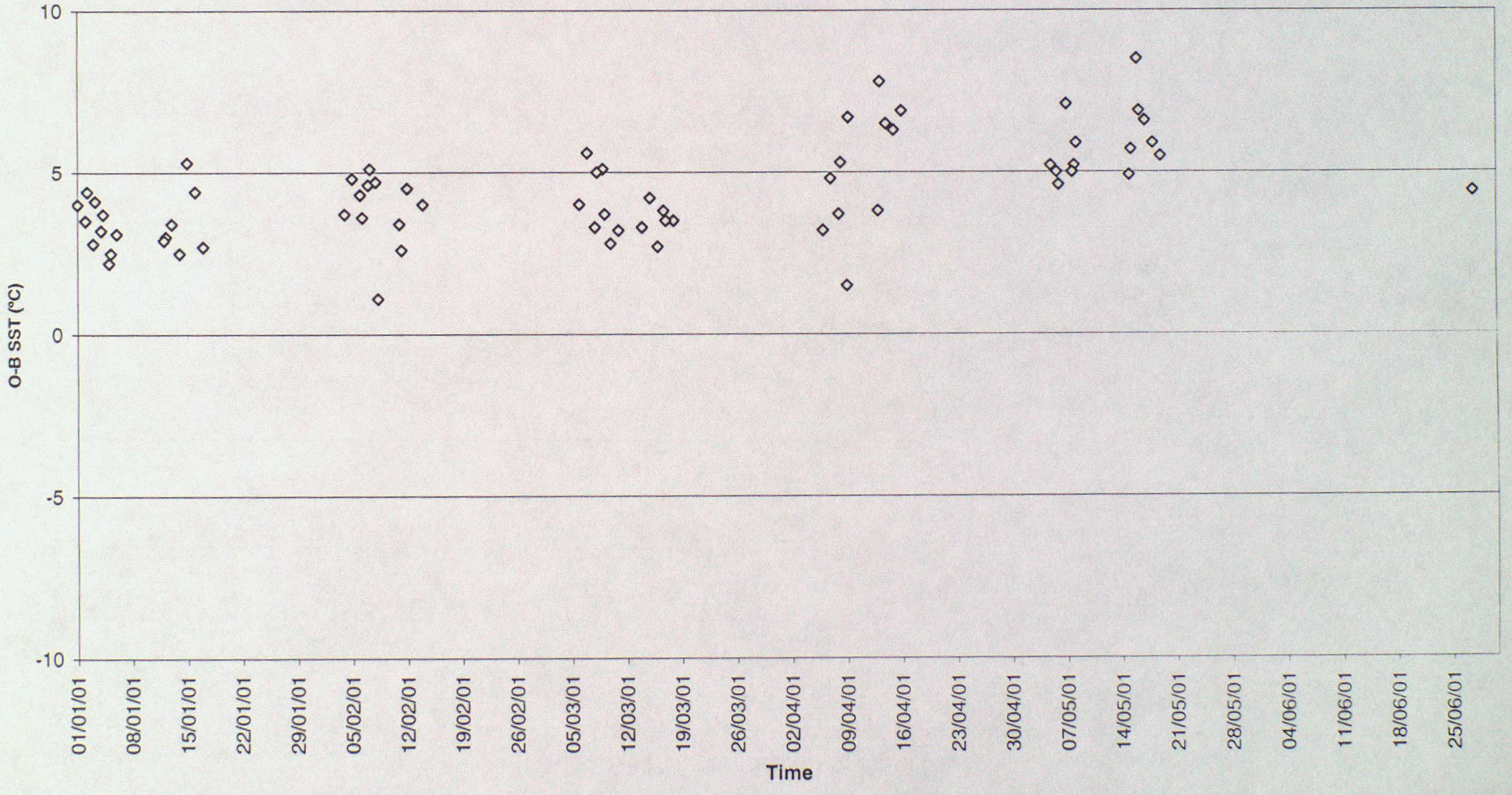
O-B SST (°C) for identifier ELWT7
Number of obs. plotted = 3195    Number of outliers = 2





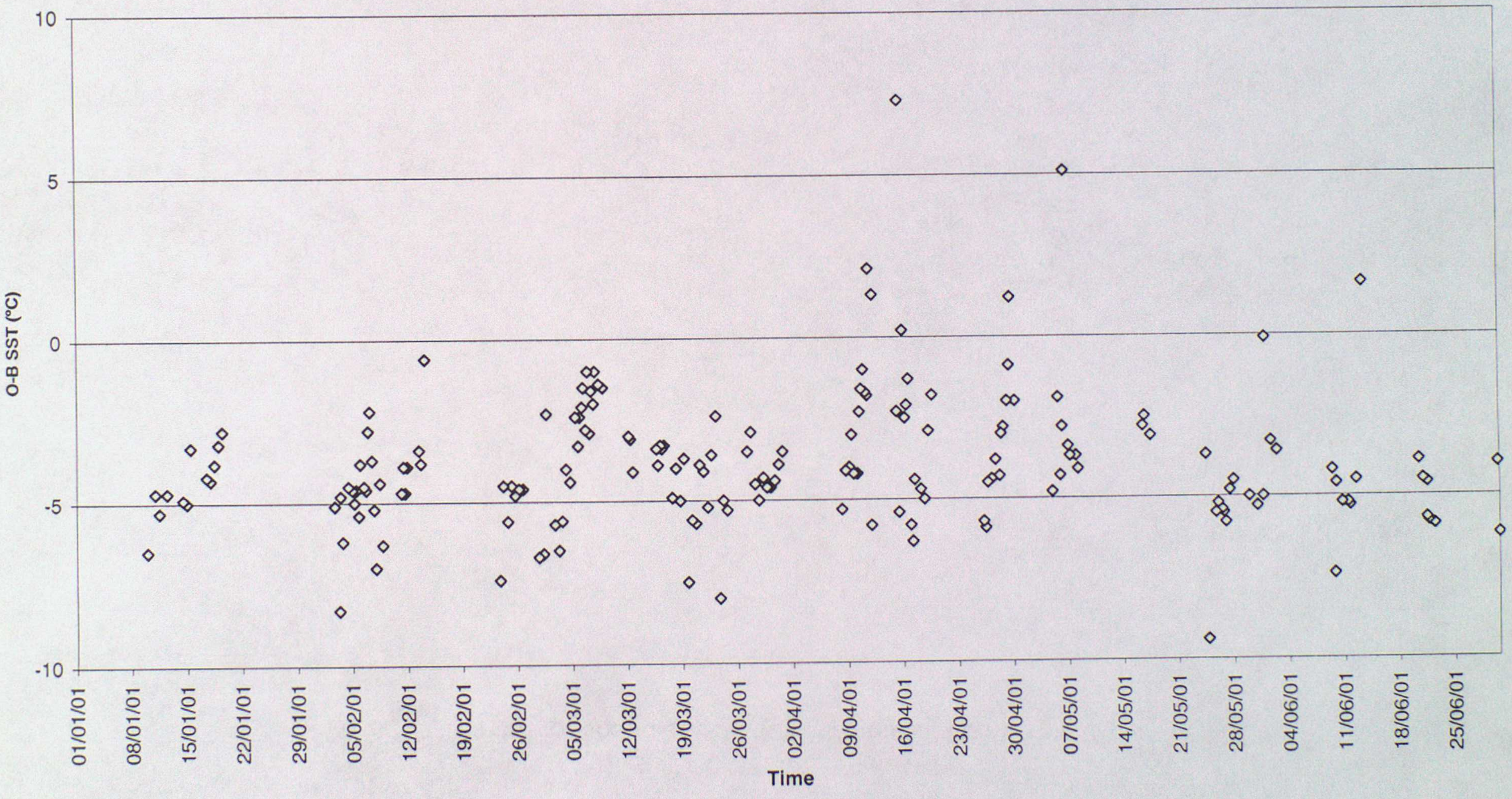
O-B SST (°C) for identifier ELWY3
Number of obs. plotted = 60    Number of outliers = 0

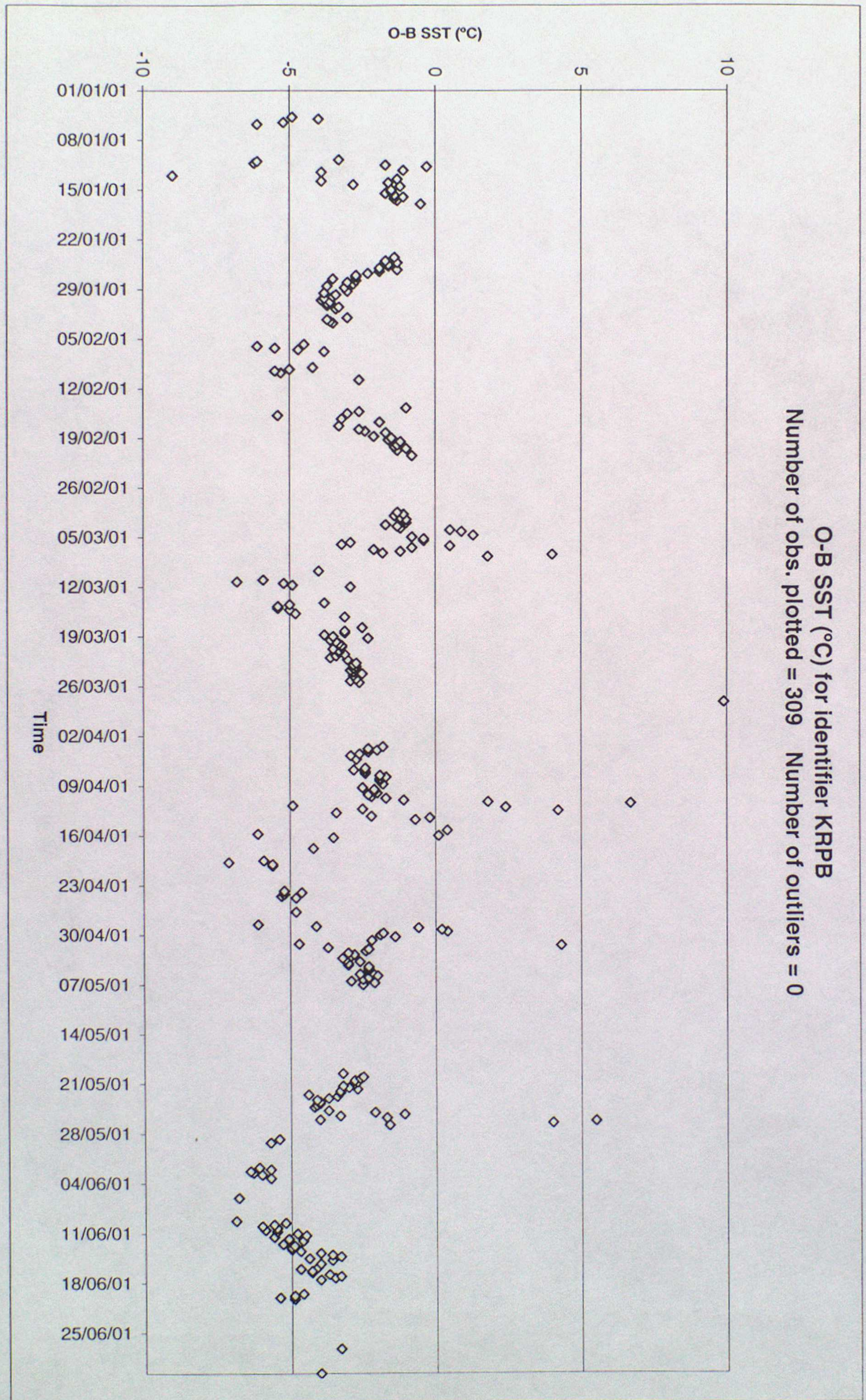

O-B SST (°C) for identifier ELXT8
Number of obs. plotted = 193   Number of outliers = 0
O-B SST (°C)
-30
-20
-10
0
10
20
30
Time
01/01/01
08/01/01
15/01/01
22/01/01
29/01/01
05/02/01
12/02/01
19/02/01
26/02/01
05/03/01
12/03/01
19/03/01
26/03/01
02/04/01
09/04/01
16/04/01
23/04/01
30/04/01
07/05/01
14/05/01
21/05/01
28/05/01
04/06/01
11/06/01
18/06/01
25/06/01



O-B SST (°C) for identifier JADY
Number of obs. plotted = 69    Number of outliers = 0

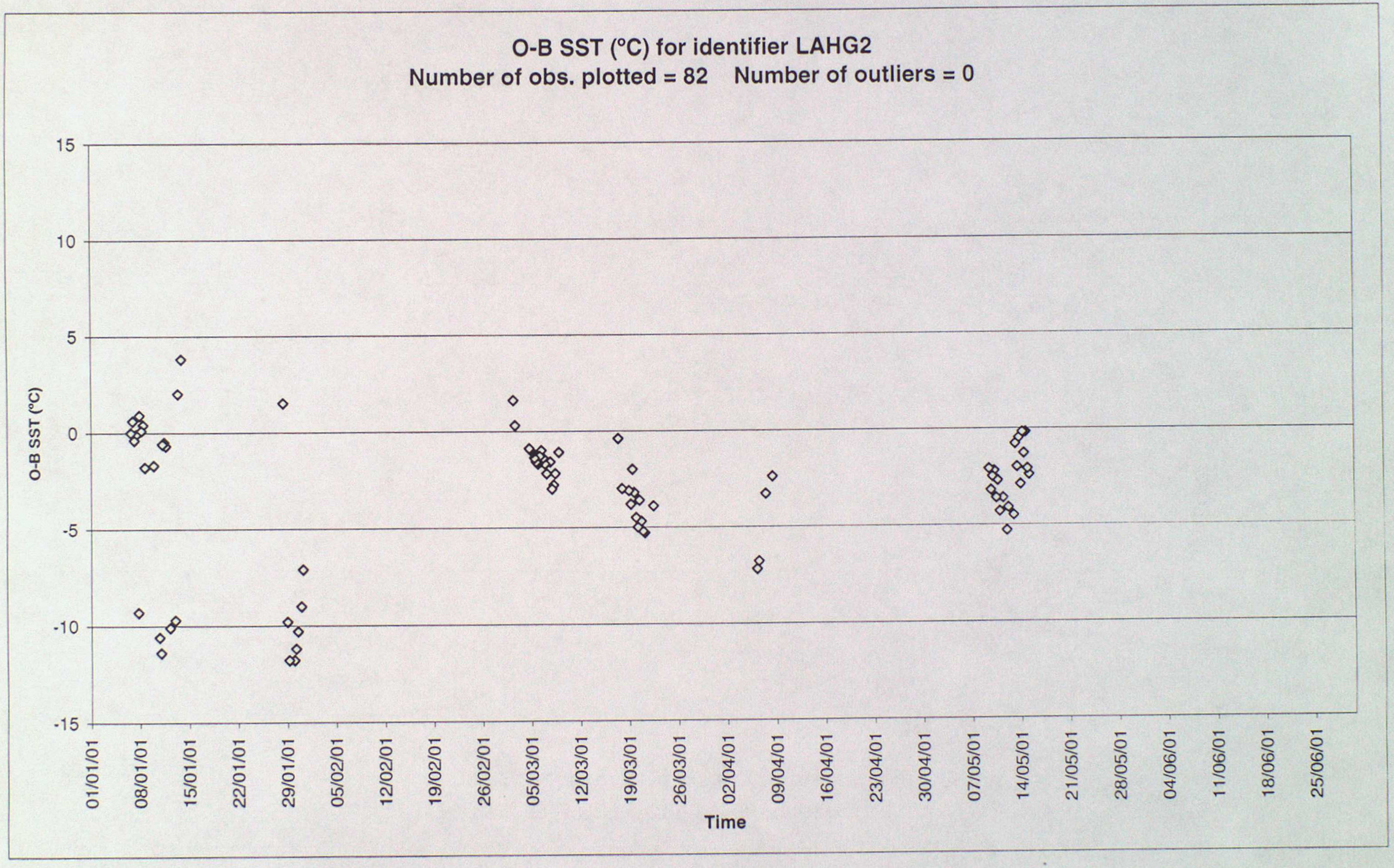
O-B SST (°C) for identifier KIOH
Number of obs. plotted = 182 Number of outliers = 1

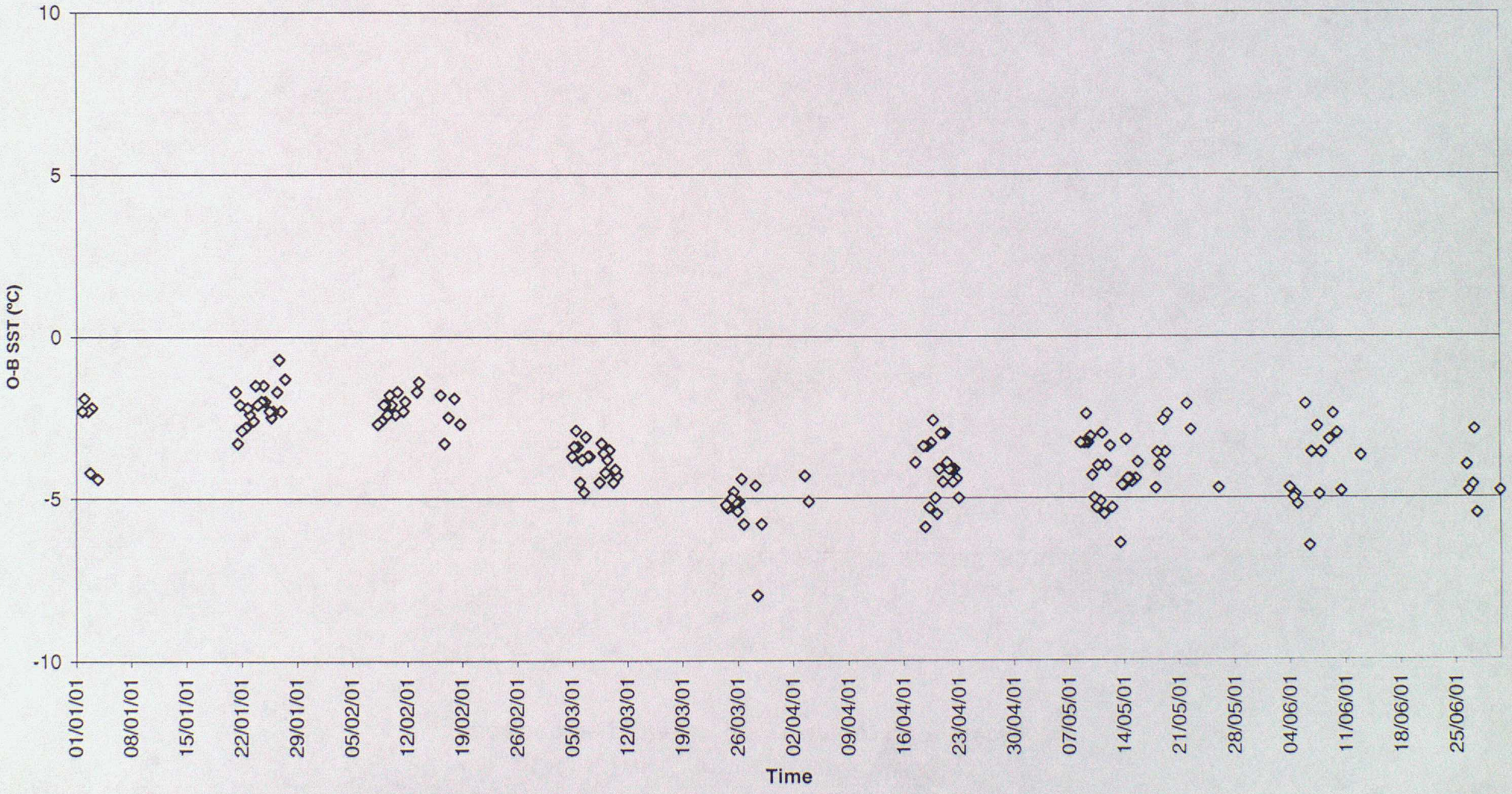




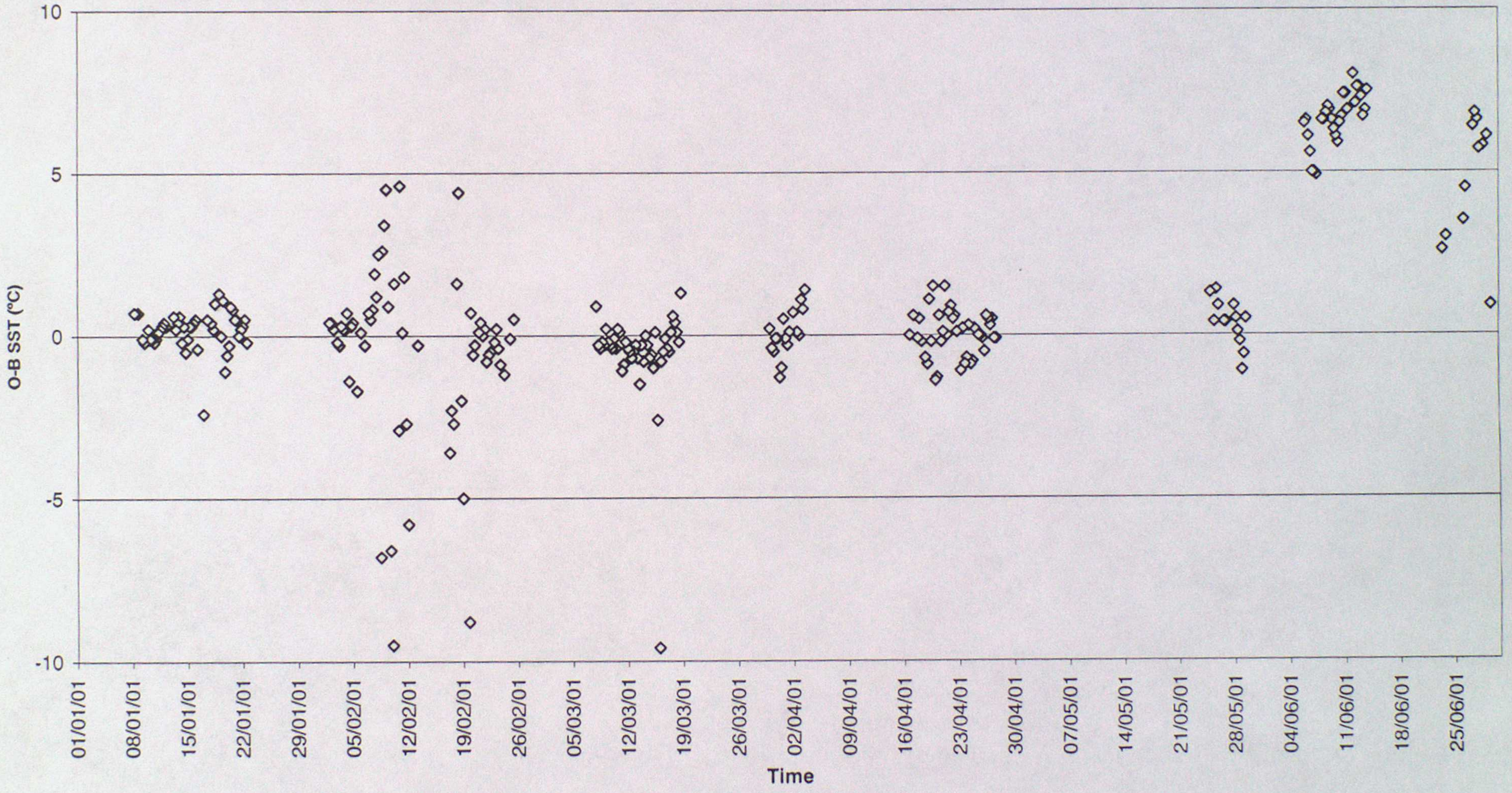
O-B SST (°C) for identifier KRPB

Number of obs. plotted = 309 Number of outliers = 0


O-B SST (°C) for identifier LAHG2
Number of obs. plotted = 82    Number of outliers = 0

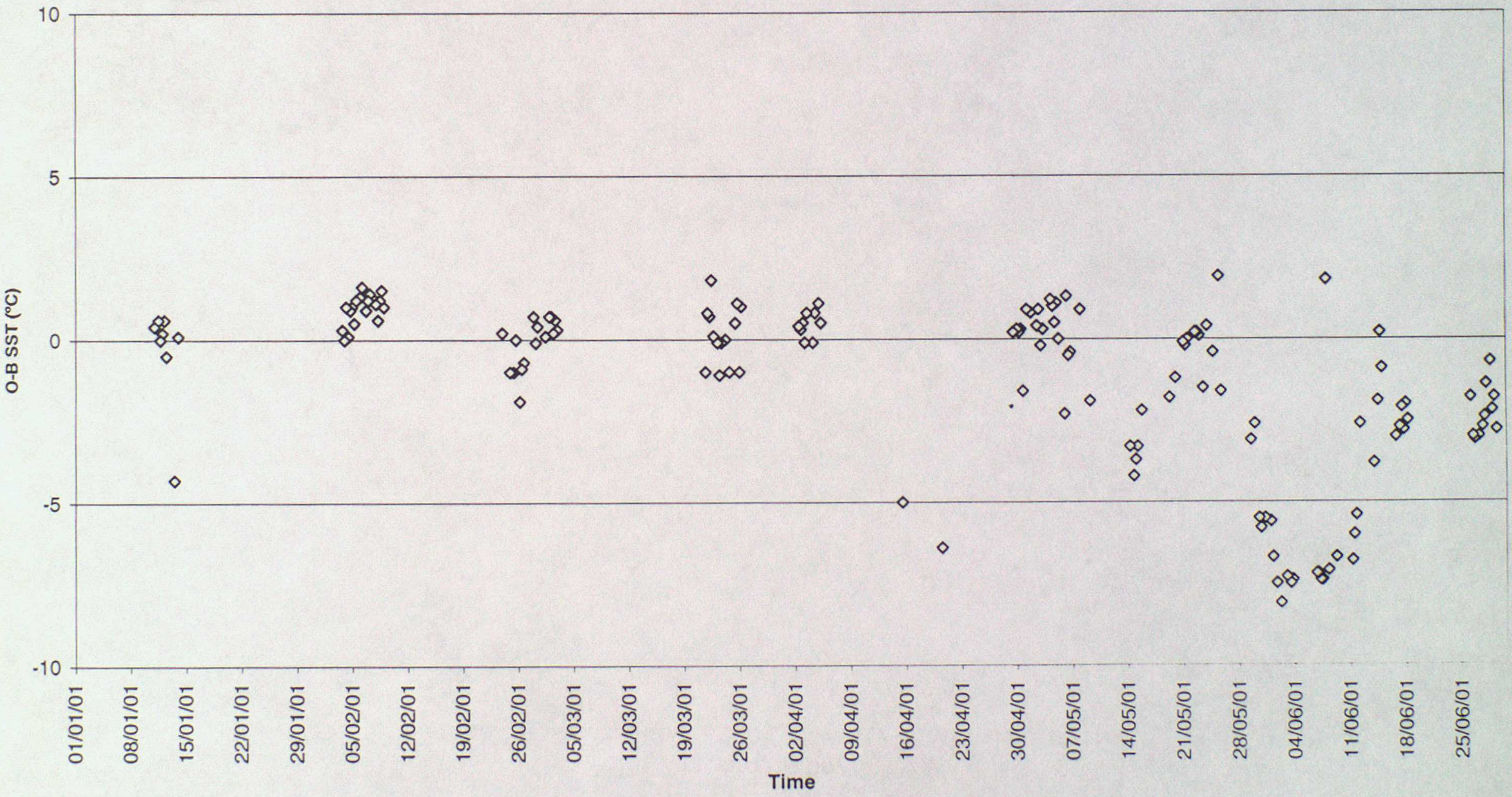


O-B SST (°C) for identifier MVXQ8
Number of obs. plotted = 151    Number of outliers = 0

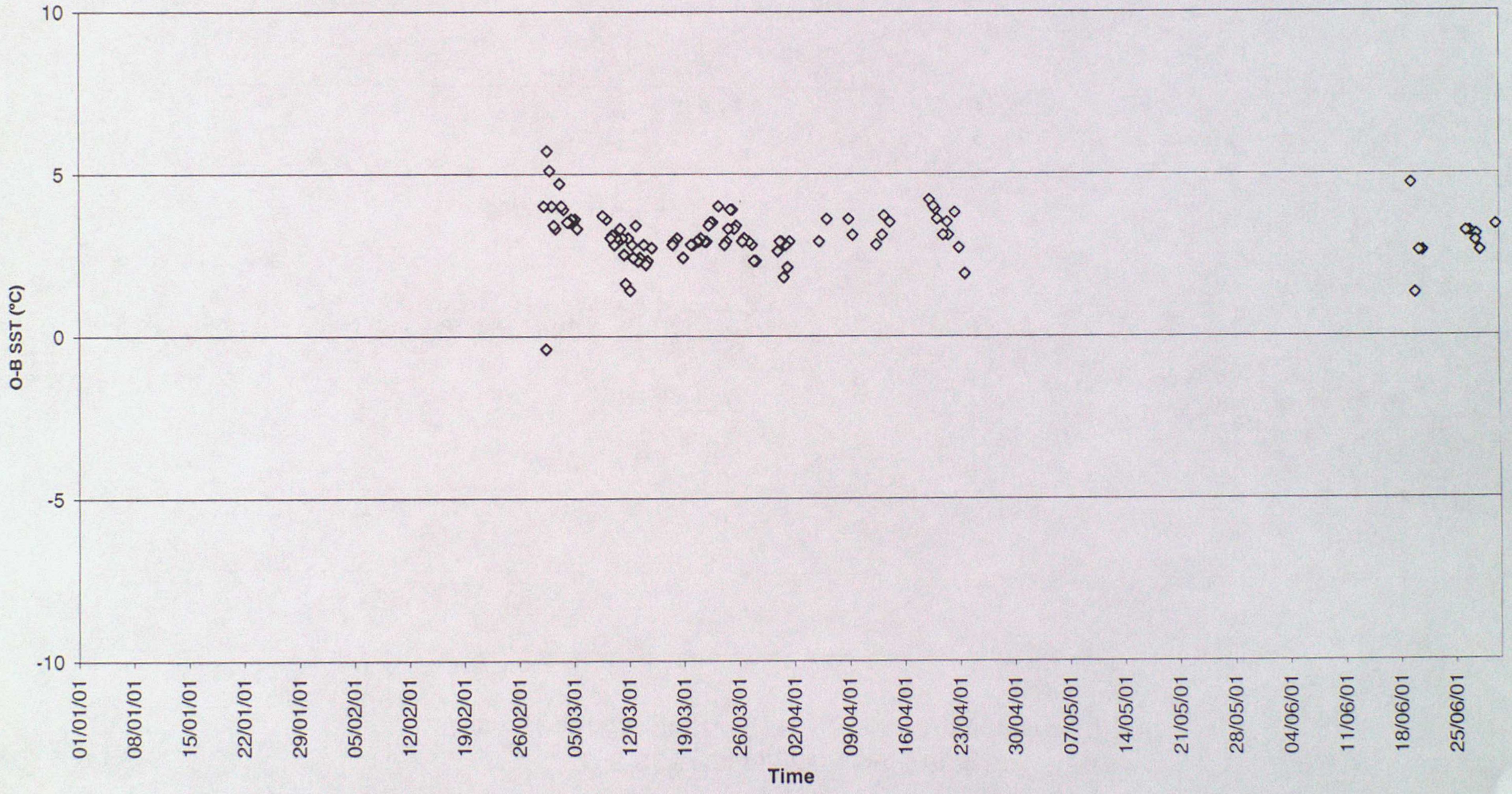


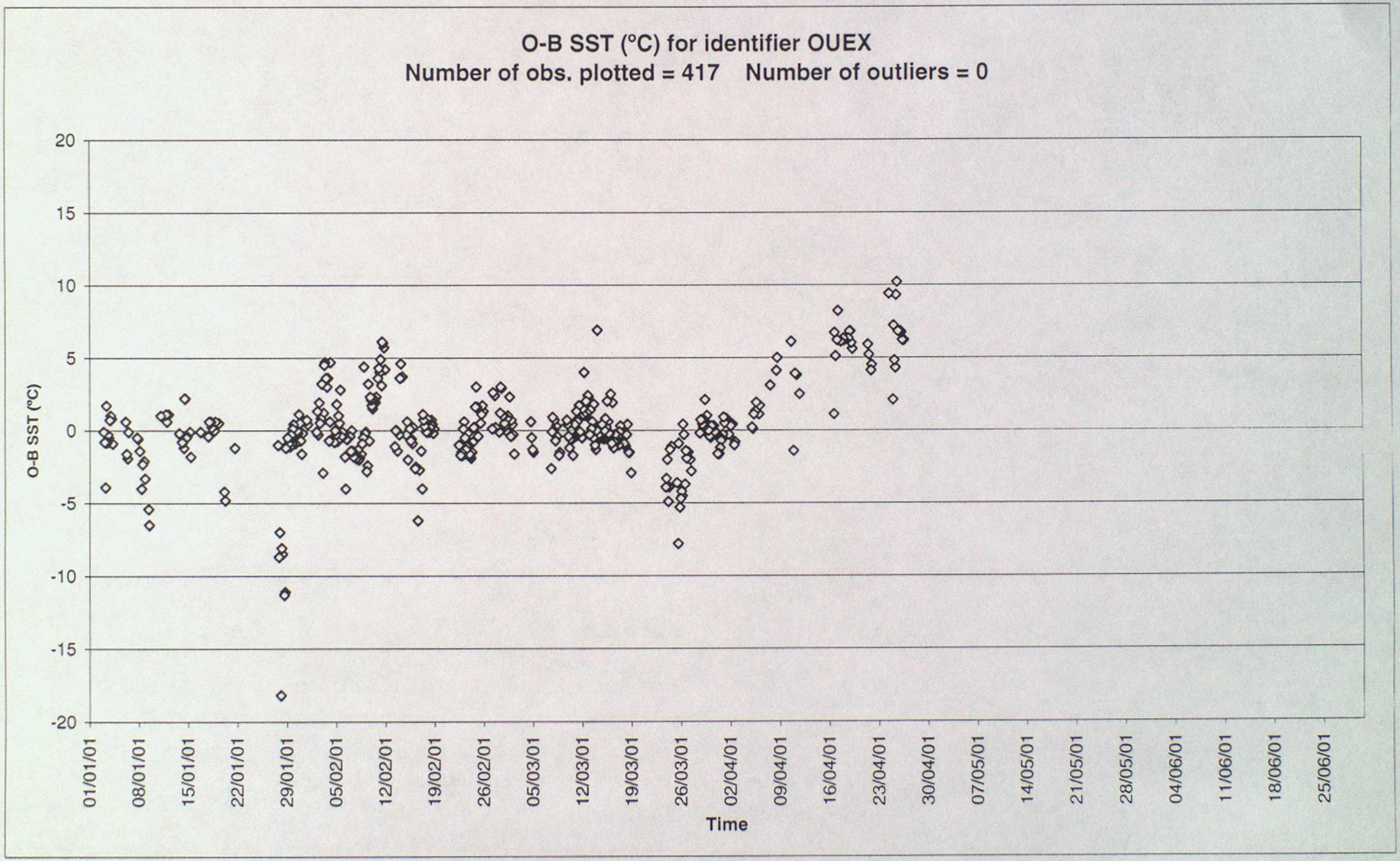
O-B SST (°C) for identifier MWBI9
Number of obs. plotted = 262    Number of outliers = 0

## O-B SST (°C) for identifier MZGK7
Number of obs. plotted = 152    Number of outliers = 1



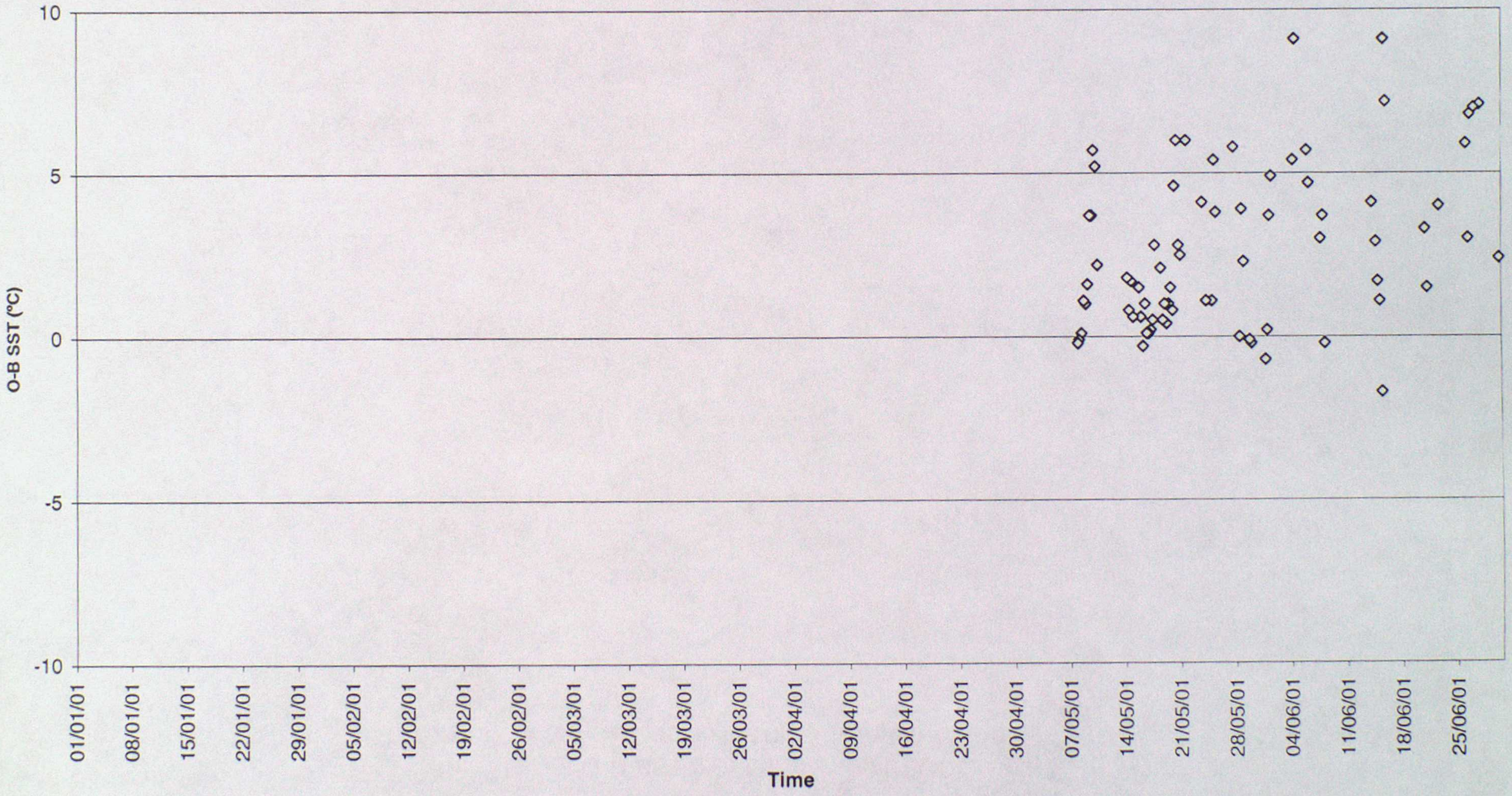
O-B SST (°C) for identifier NLGF
Number of obs. plotted = 101    Number of outliers = 1



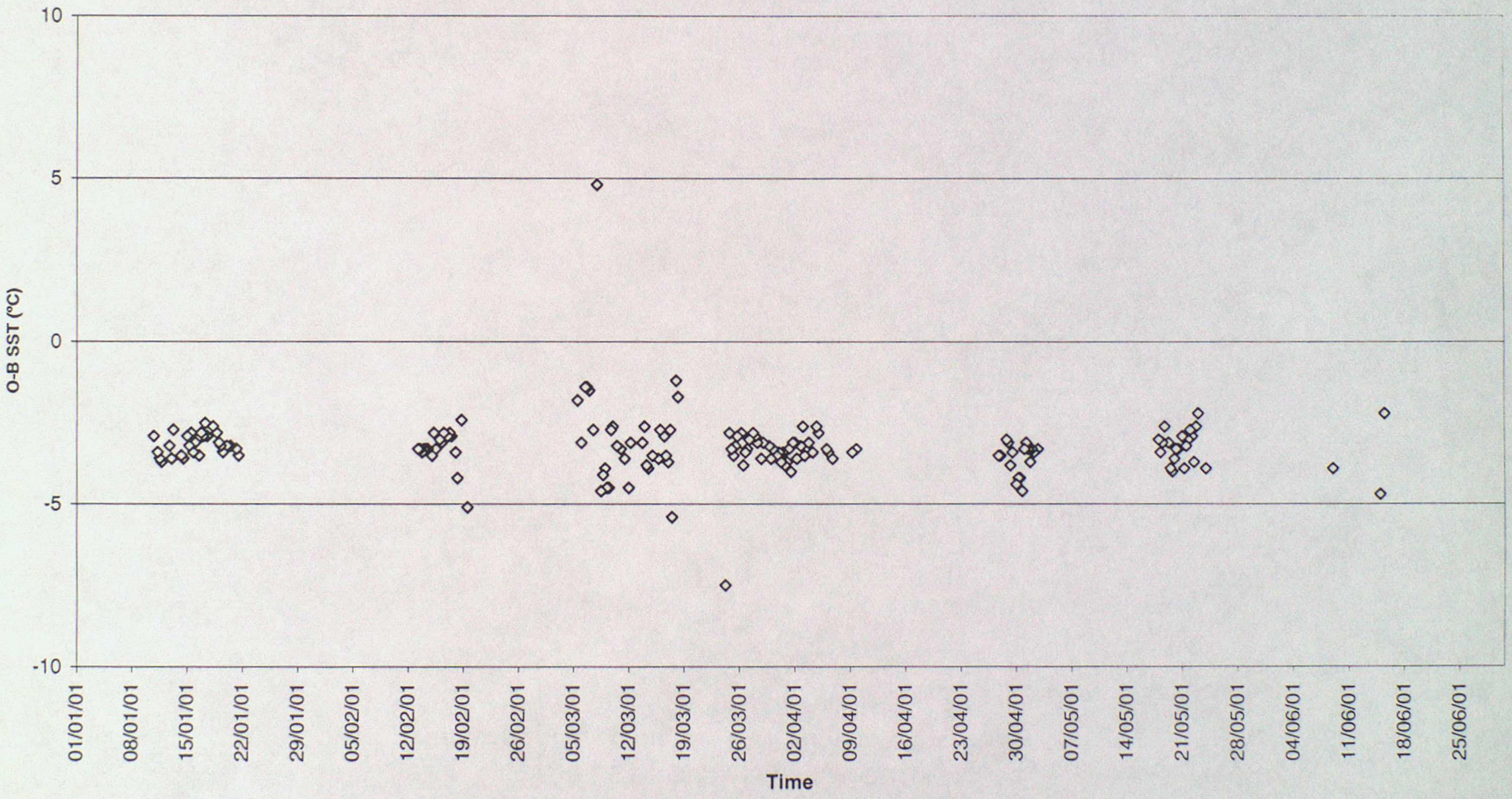


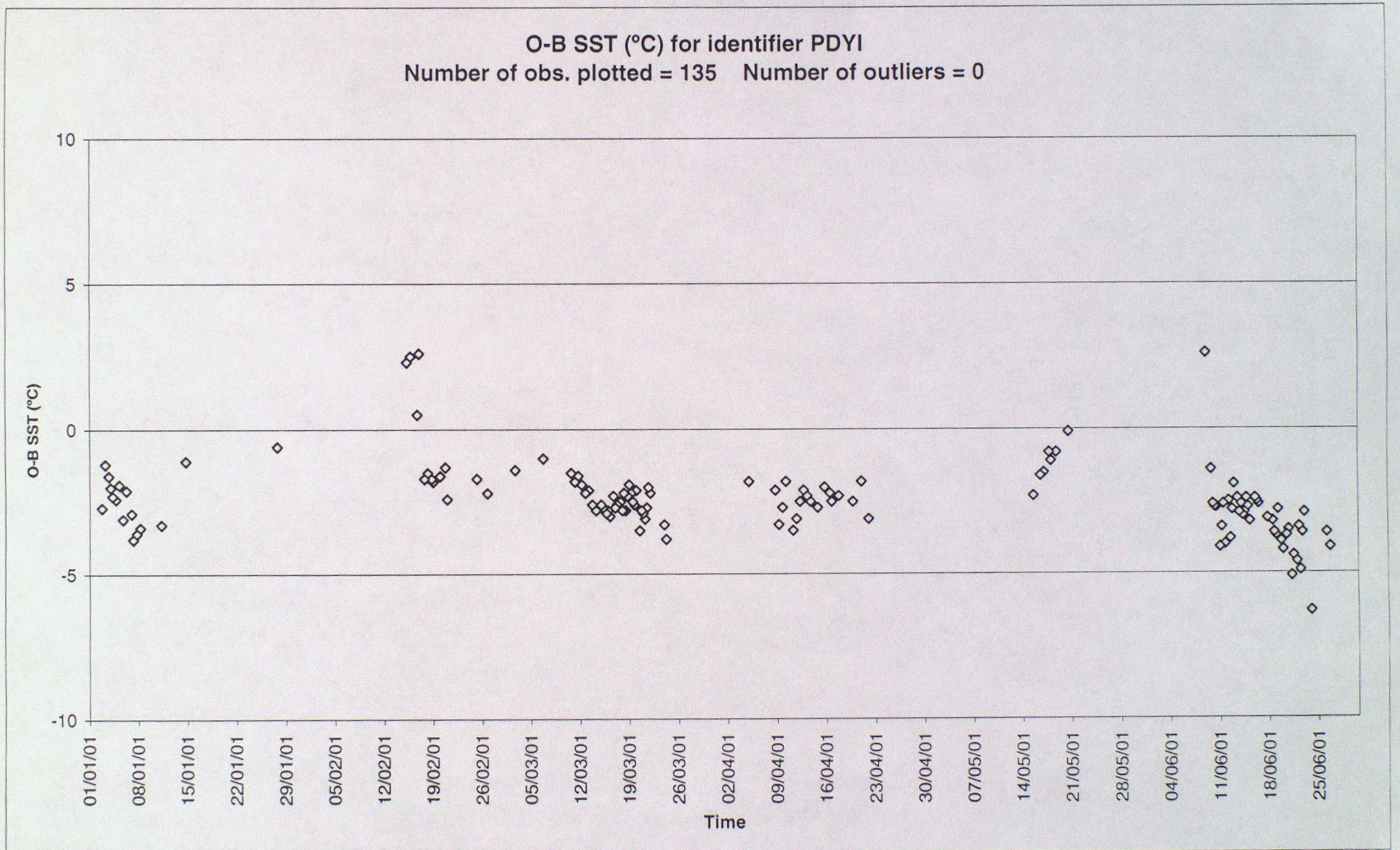
O-B SST (°C) for identifier OUEX
Number of obs. plotted = 417    Number of outliers = 0

O-B SST (°C) for identifier OUGY
Number of obs. plotted = 74    Number of outliers = 1



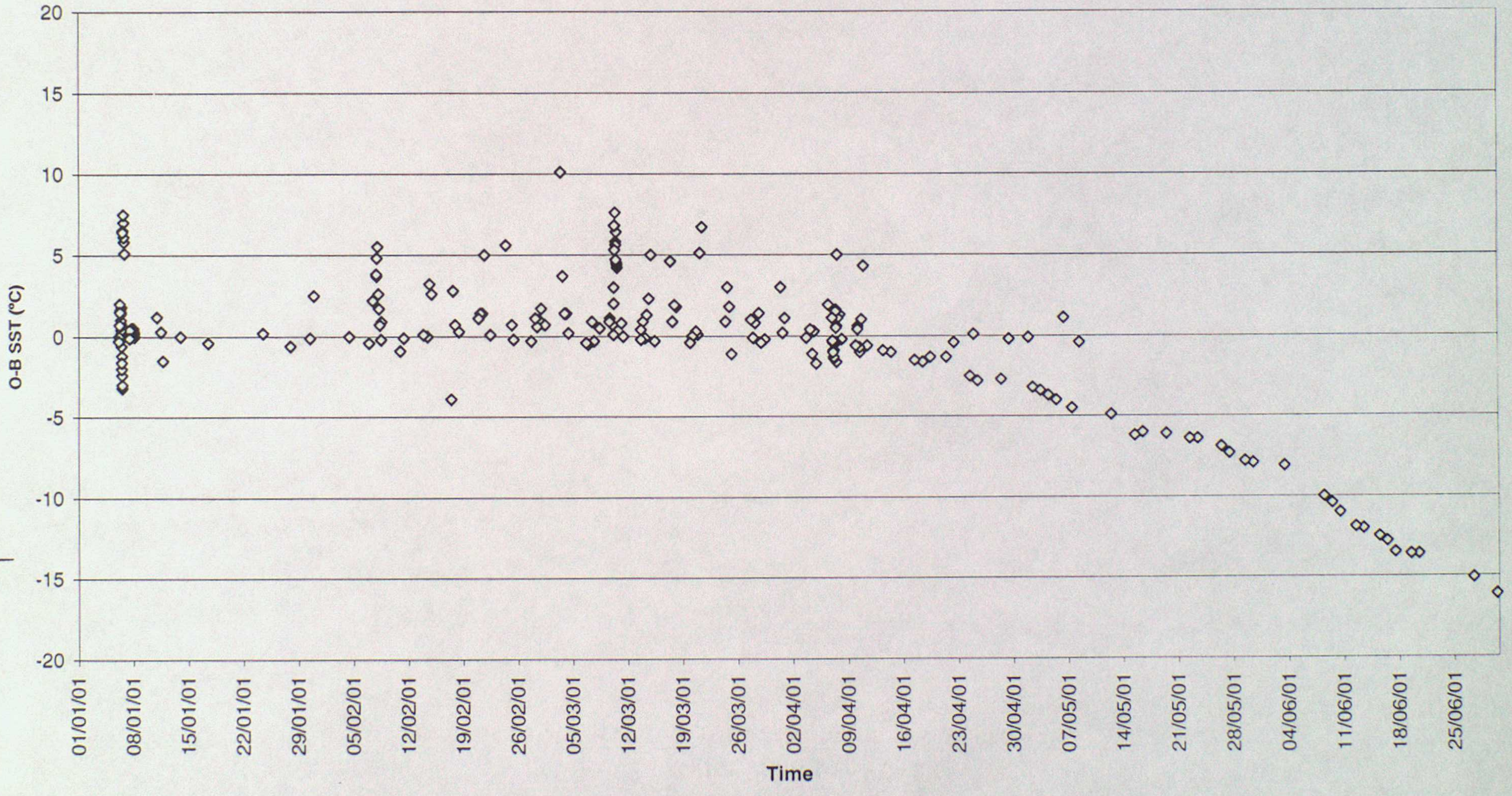
O-B SST (°C) for identifier PCQL
Number of obs. plotted = 163    Number of outliers = 0





O-B SST (°C) for identifier PDYI

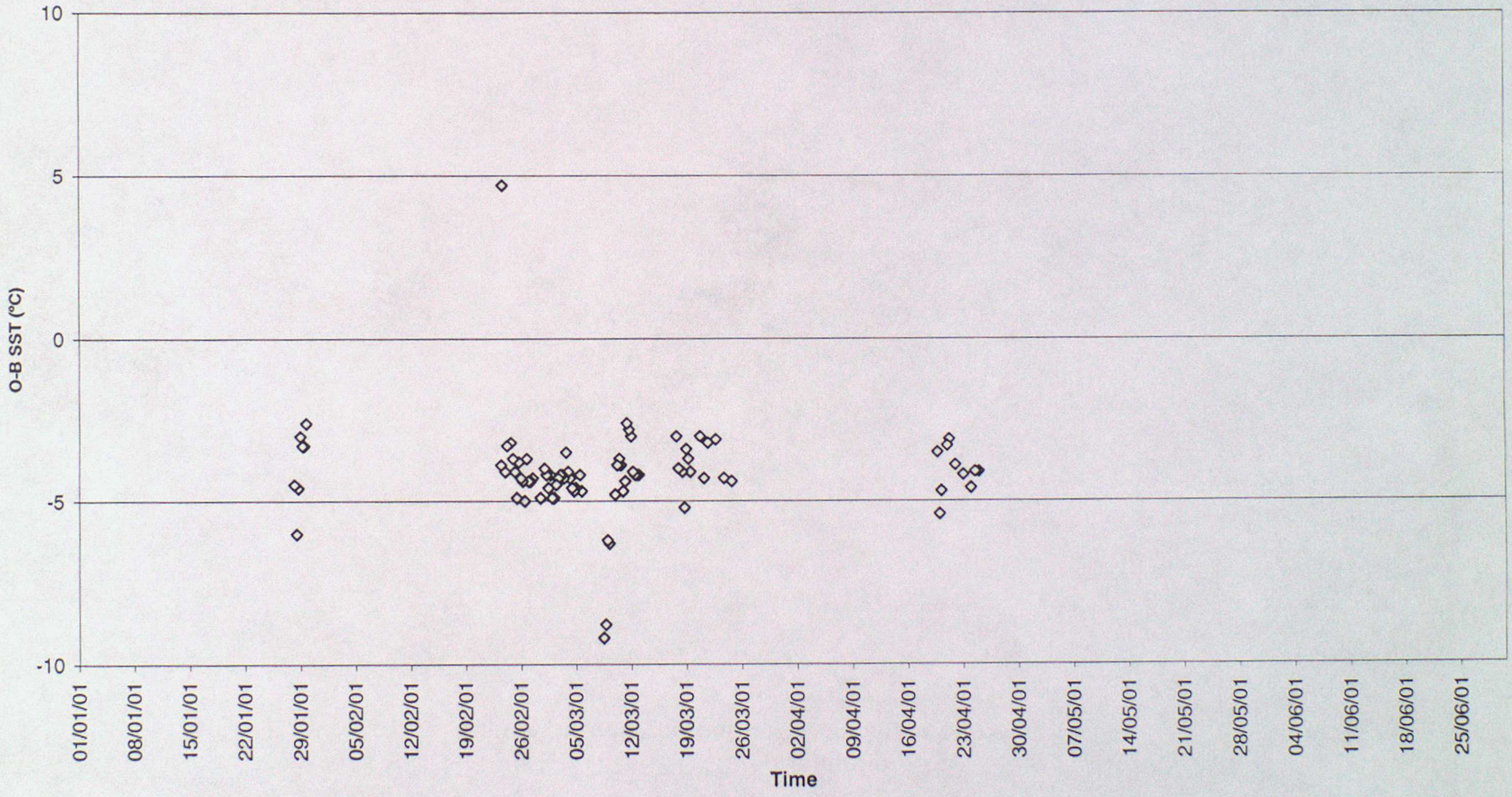
Number of obs. plotted = 135    Number of outliers = 0



O-B SST (°C) for identifier PJJU
Number of obs. plotted = 218    Number of outliers = 0

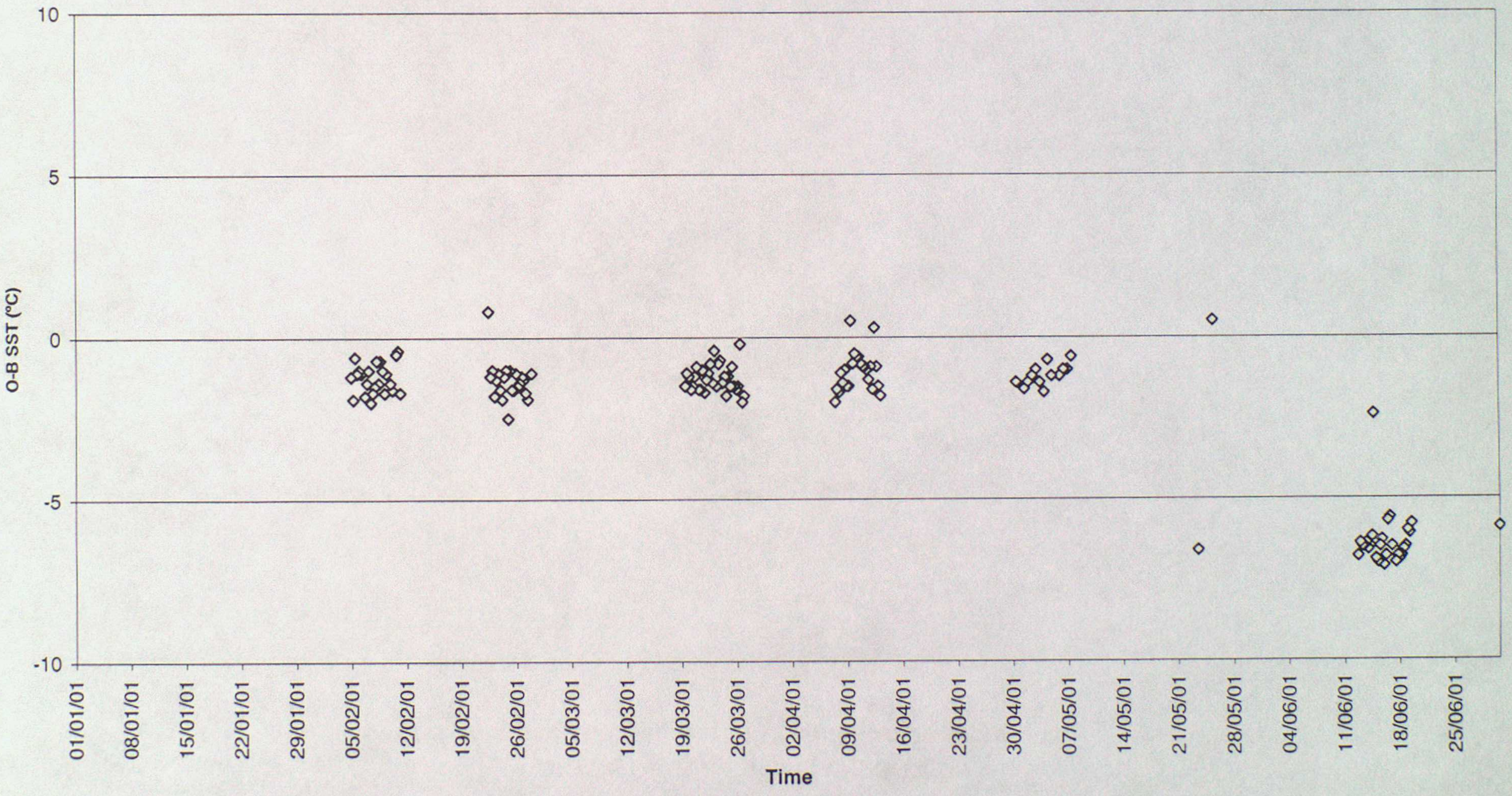
## O-B SST (°C) for identifier PJOX

Number of obs. plotted = 83    Number of outliers = 1

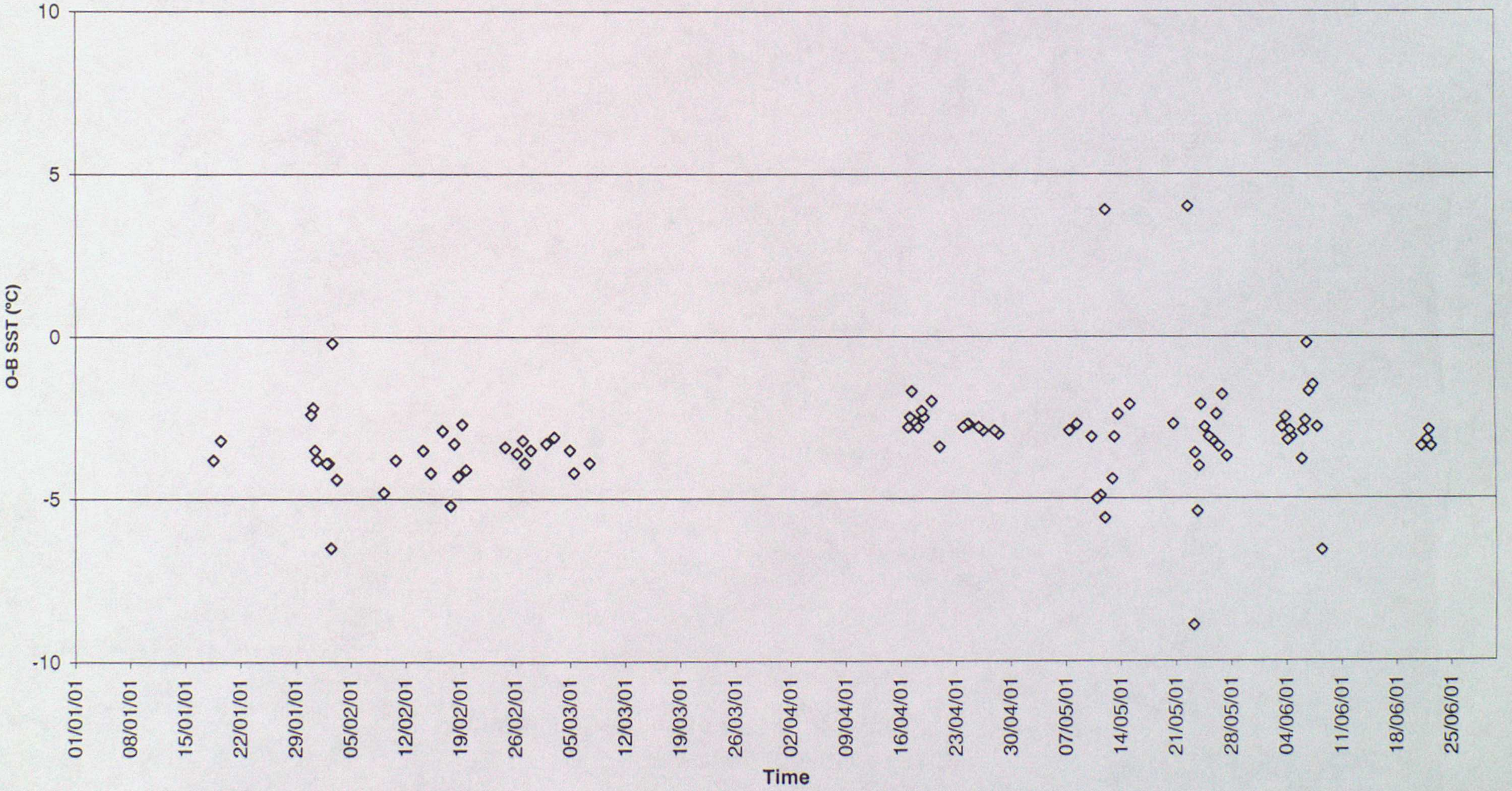


O-B SST (°C) for identifier PPSV

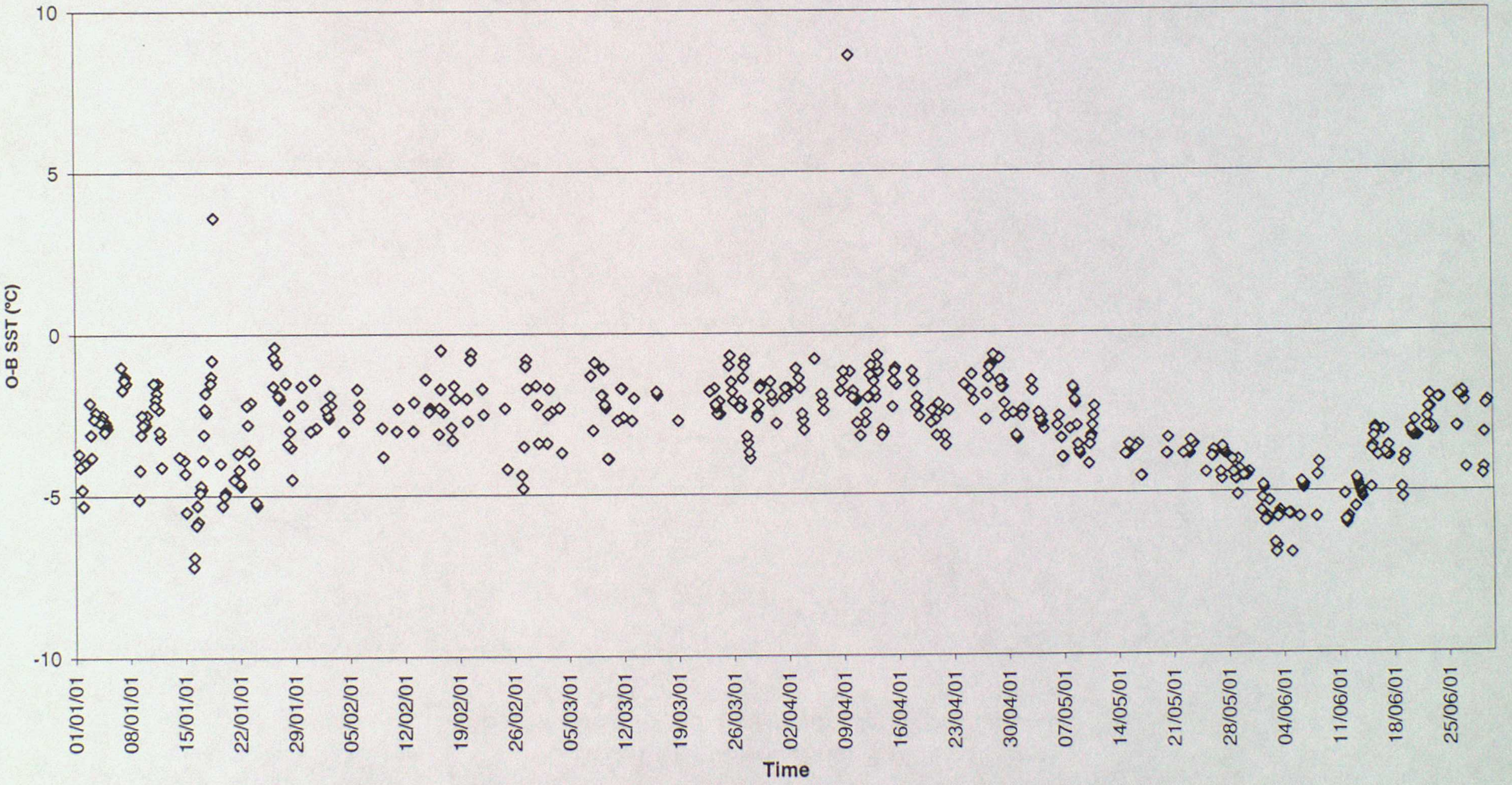
Number of obs. plotted = 143    Number of outliers = 0



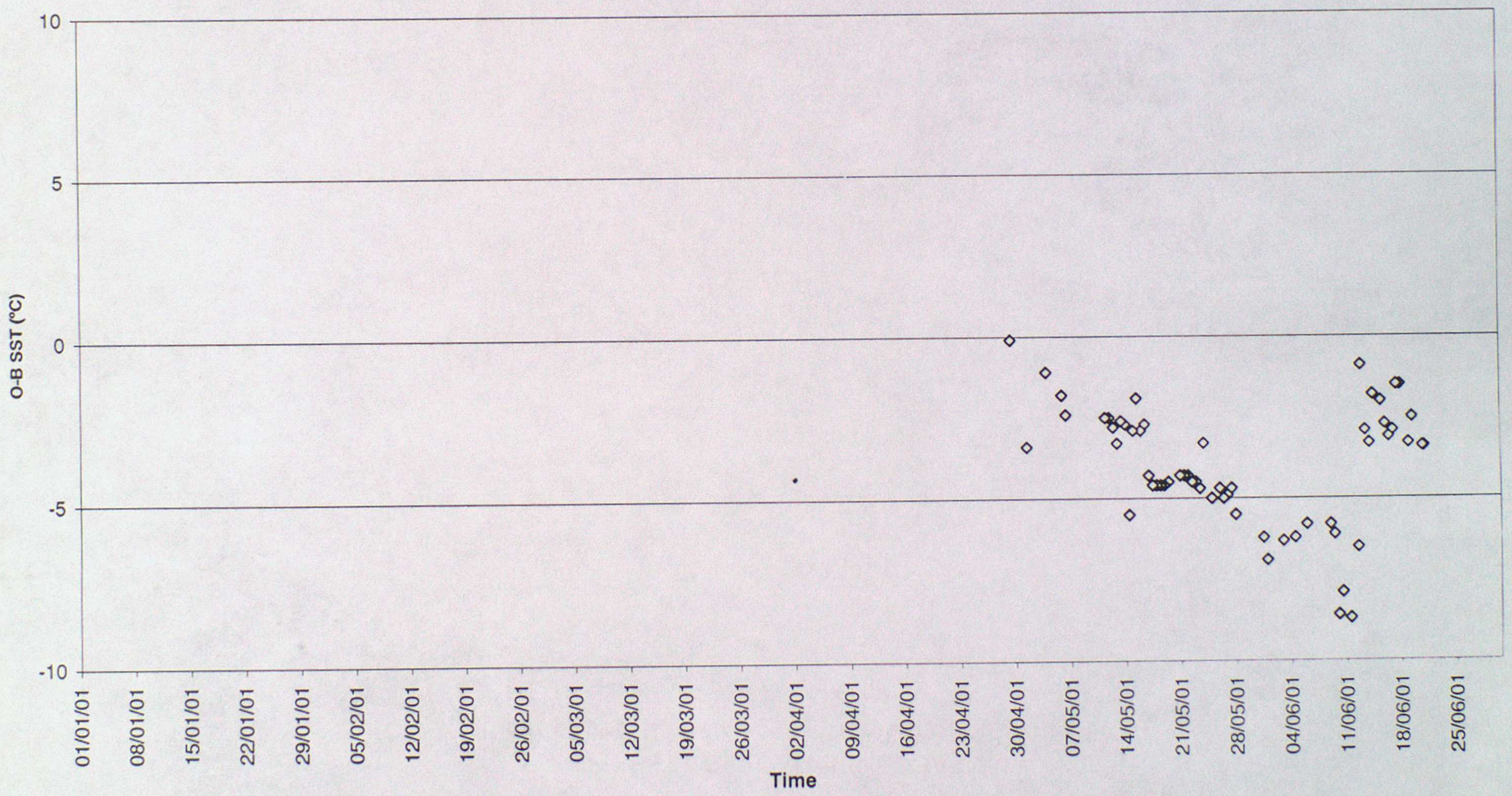
O-B SST (°C) for identifier P3ZY6
Number of obs. plotted = 89    Number of outliers = 0



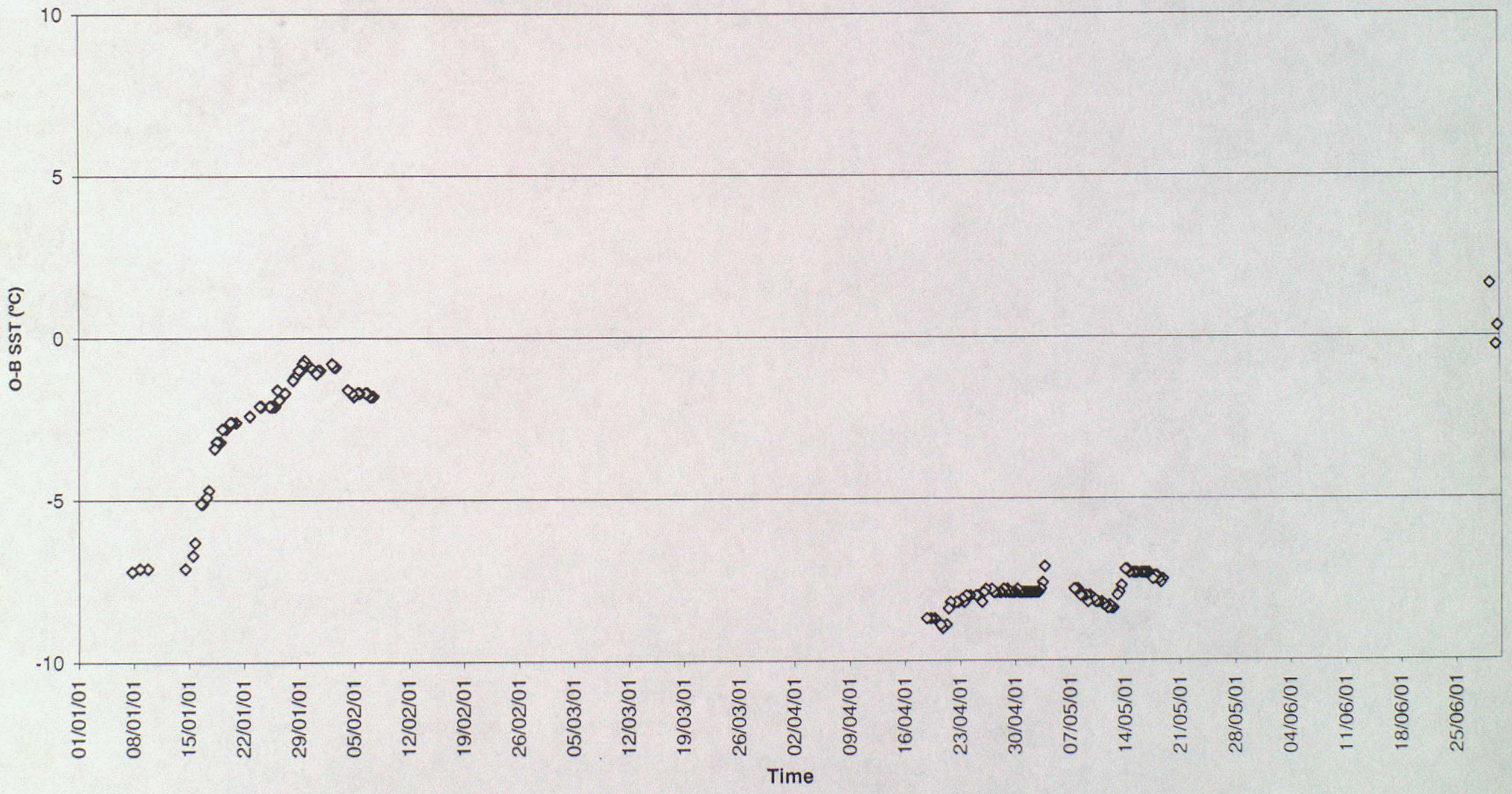
O-B SST (°C) for identifier TSMS
Number of obs. plotted = 434    Number of outliers = 1



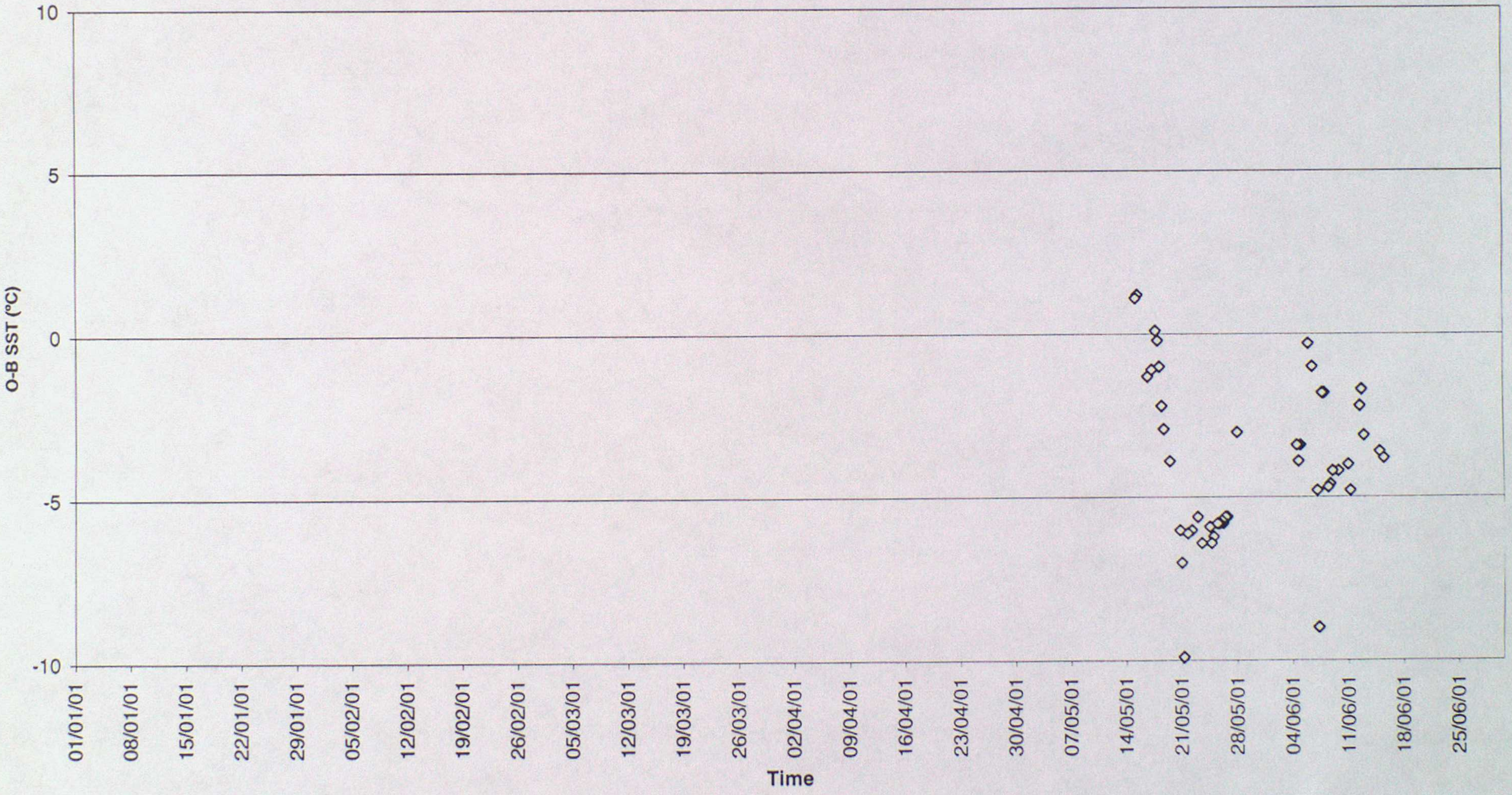
O-B SST (°C) for identifier UAIS
Number of obs. plotted = 60    Number of outliers = 0



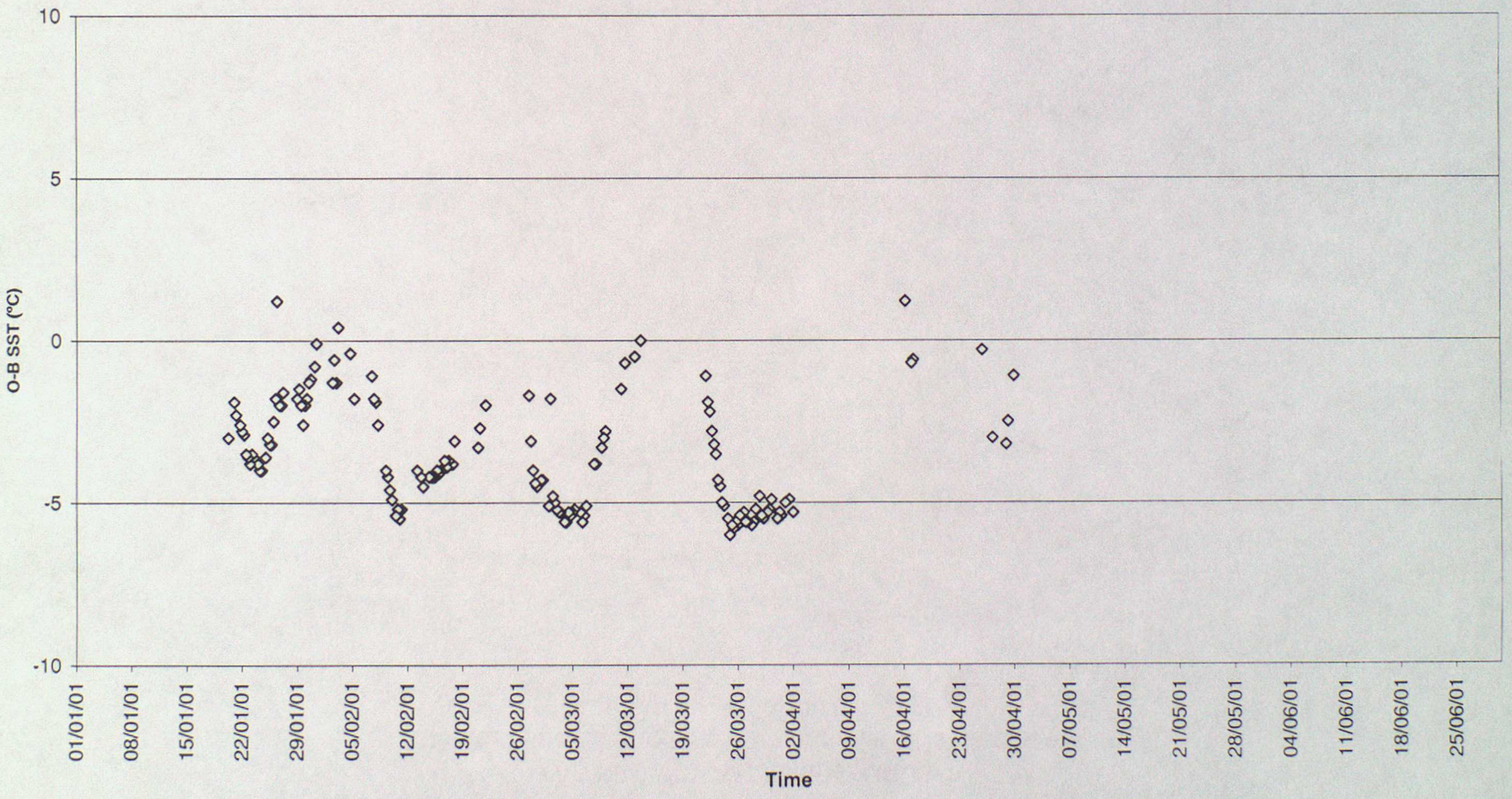
O-B SST (°C) for identifier UBAW
Number of obs. plotted = 140    Number of outliers = 0

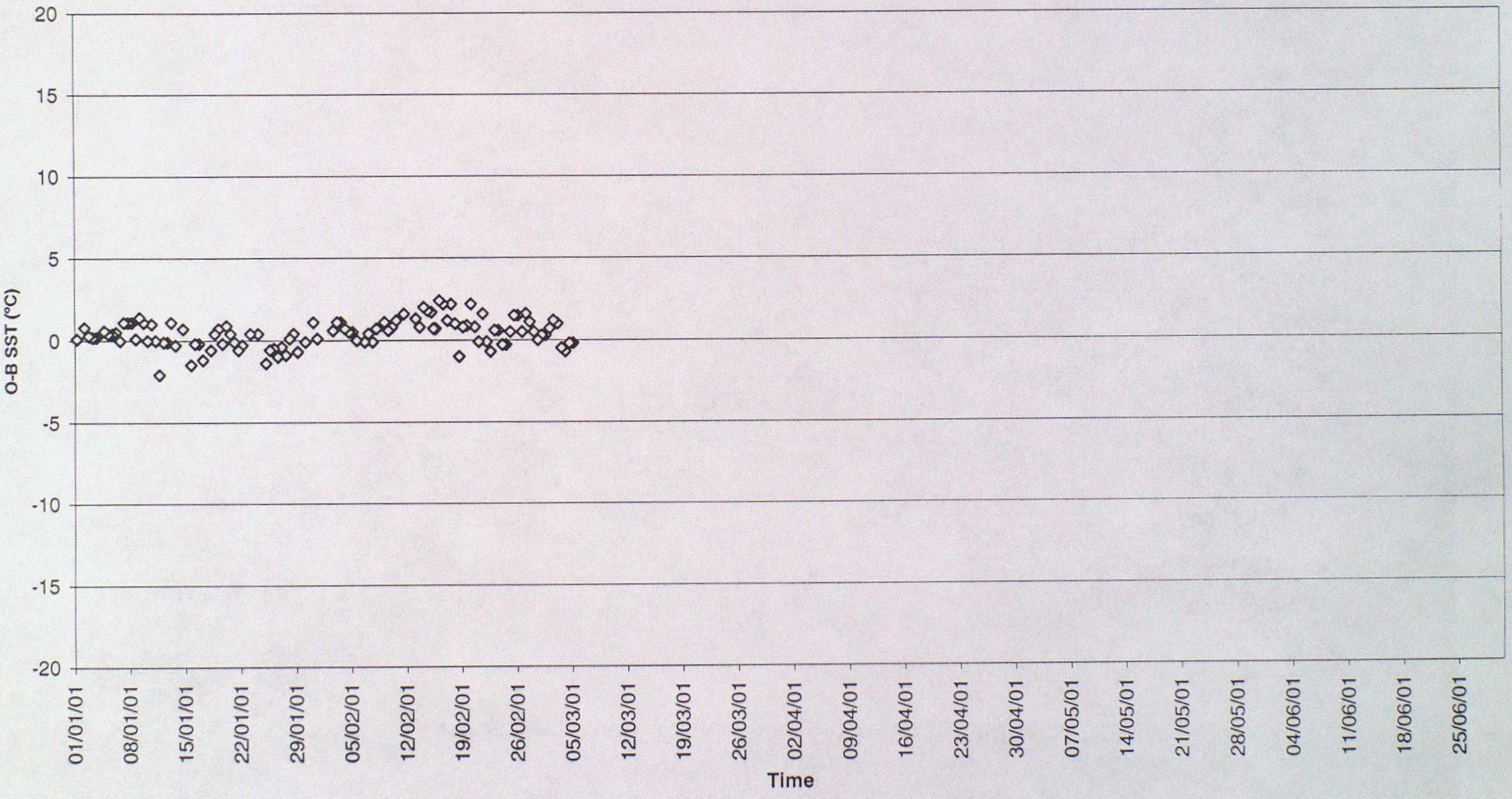


O-B SST (°C) for identifier UCUP
Number of obs. plotted = 47    Number of outliers = 0



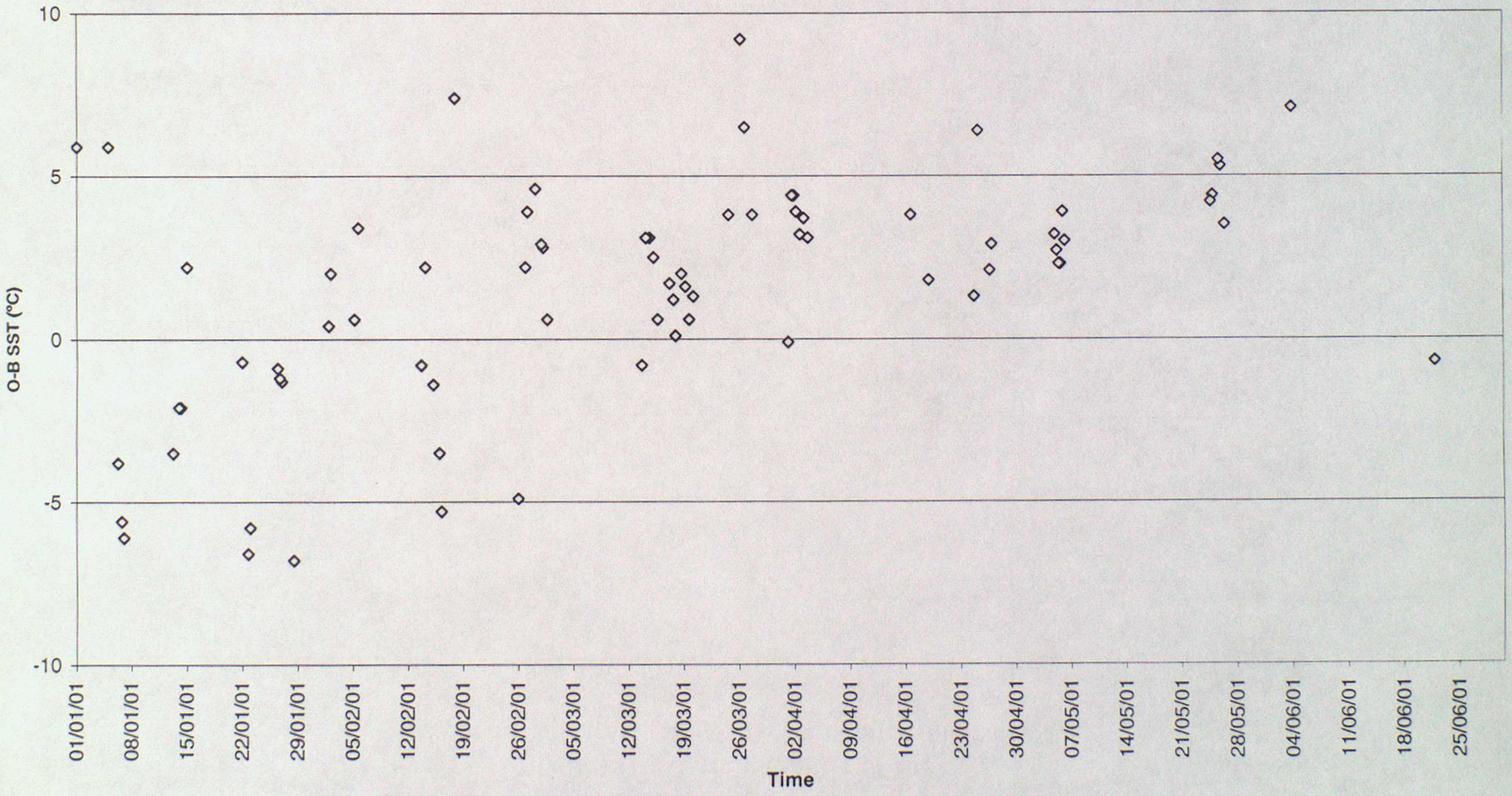
O-B SST (°C) for identifier UDWE
Number of obs. plotted = 146    Number of outliers = 0

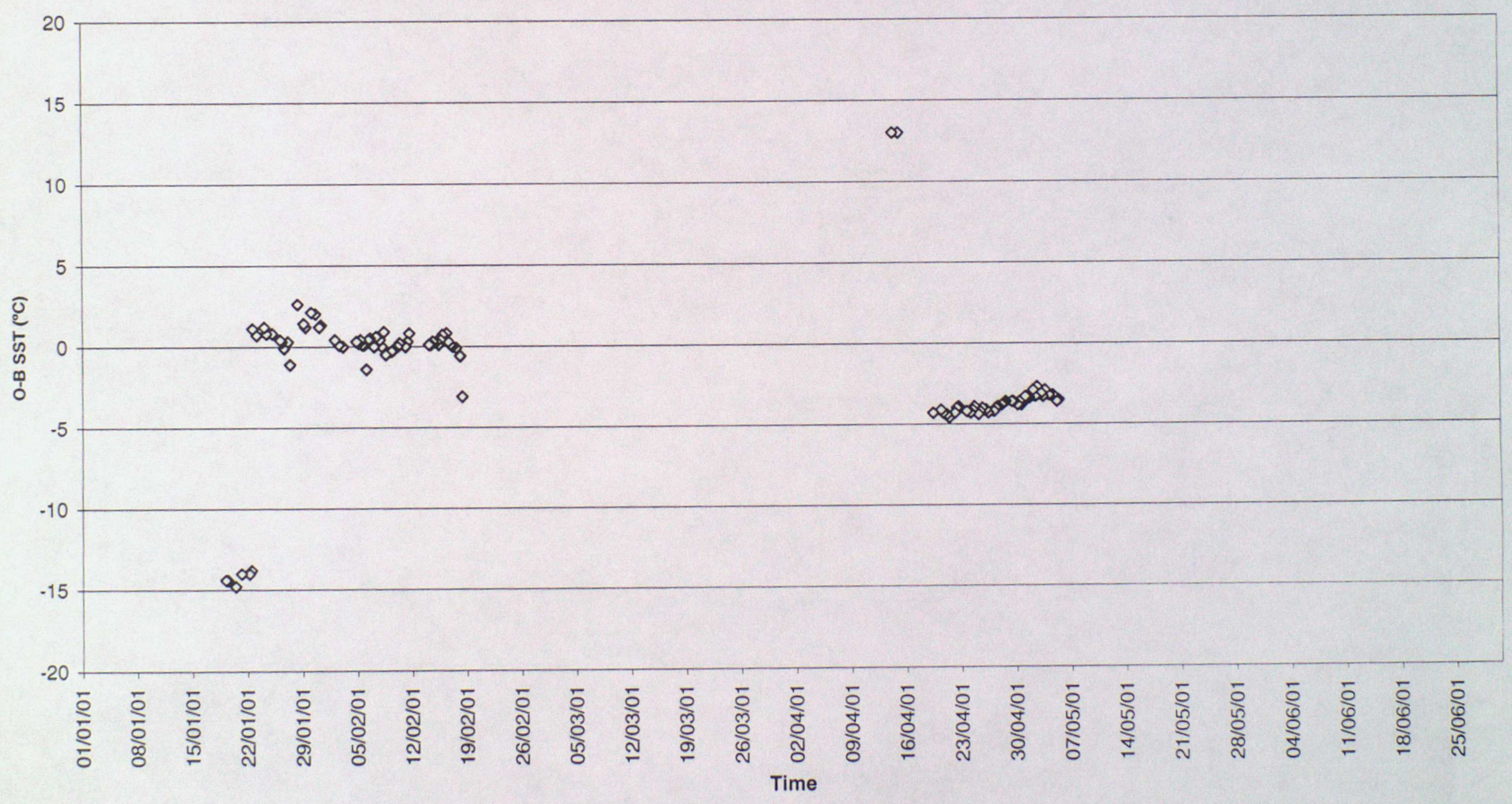




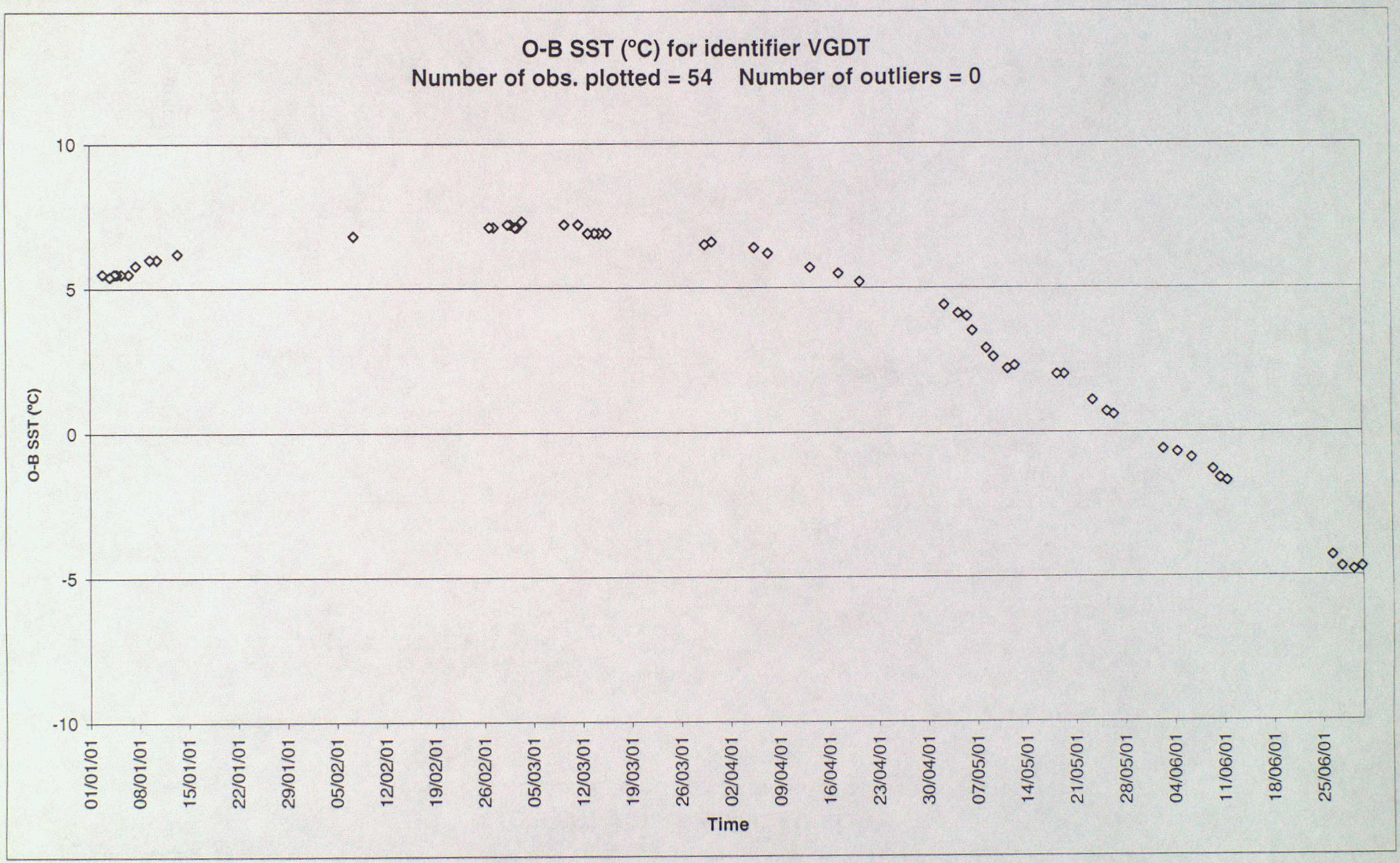
O-B SST (°C) for identifier UFNH
Number of obs. plotted = 110 Number of outliers = 36

O-B SST (°C) for identifier UGMC
Number of obs. plotted = 75    Number of outliers = 0



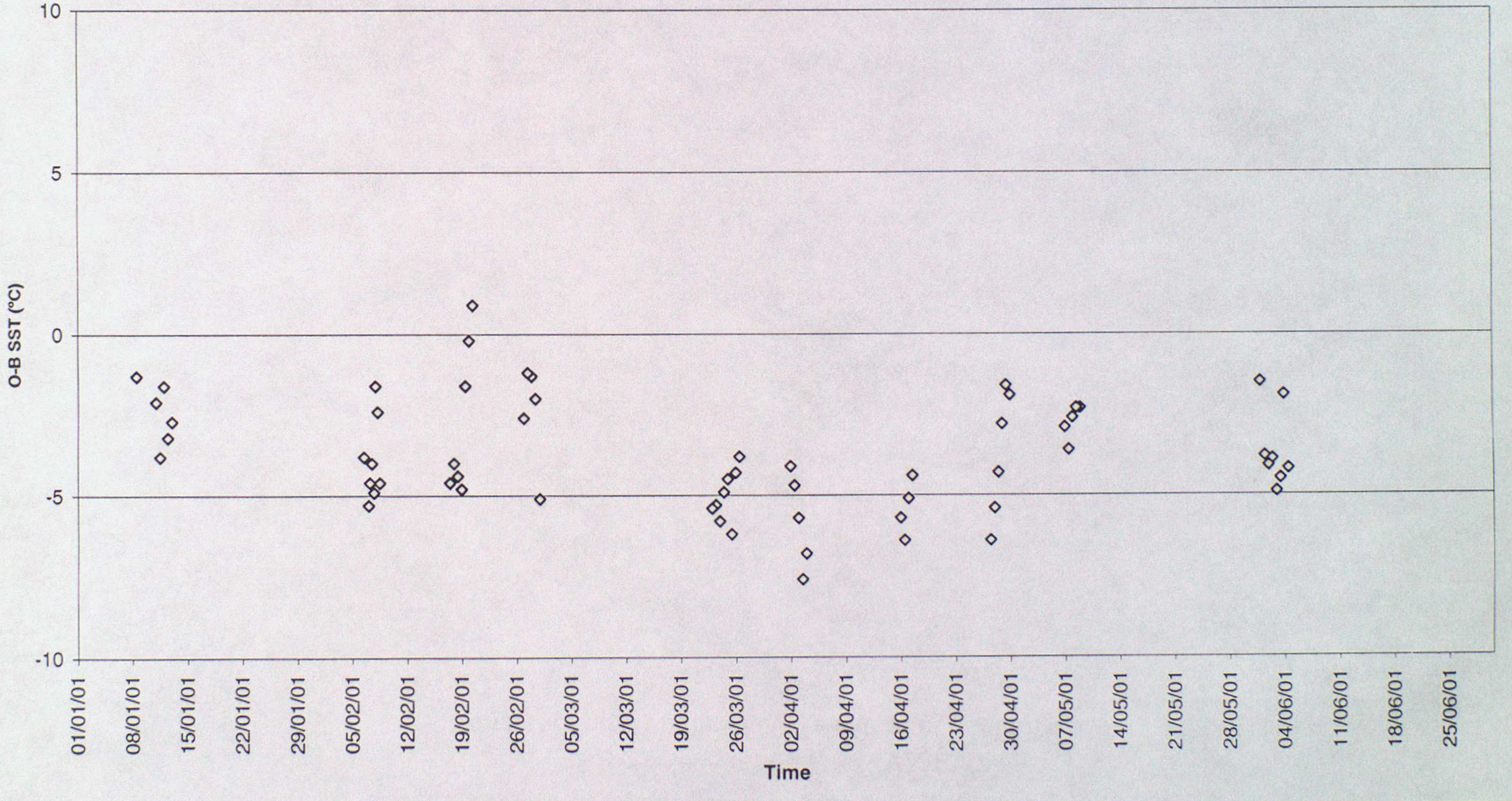


O-B SST (°C) for identifier UIAI
Number of obs. plotted = 104    Number of outliers = 1

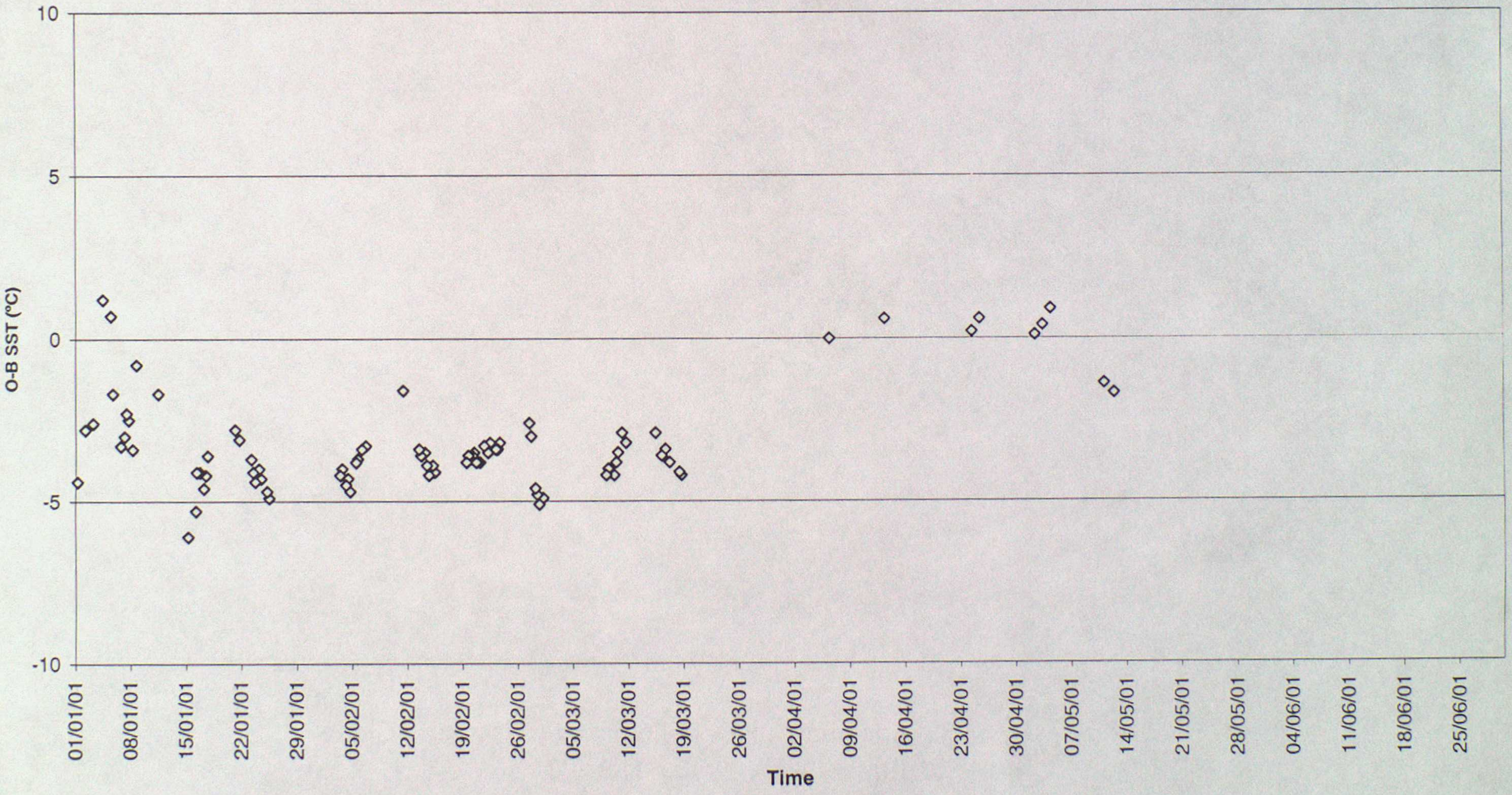


O-B SST (°C) for identifier VGDT
Number of obs. plotted = 54    Number of outliers = 0

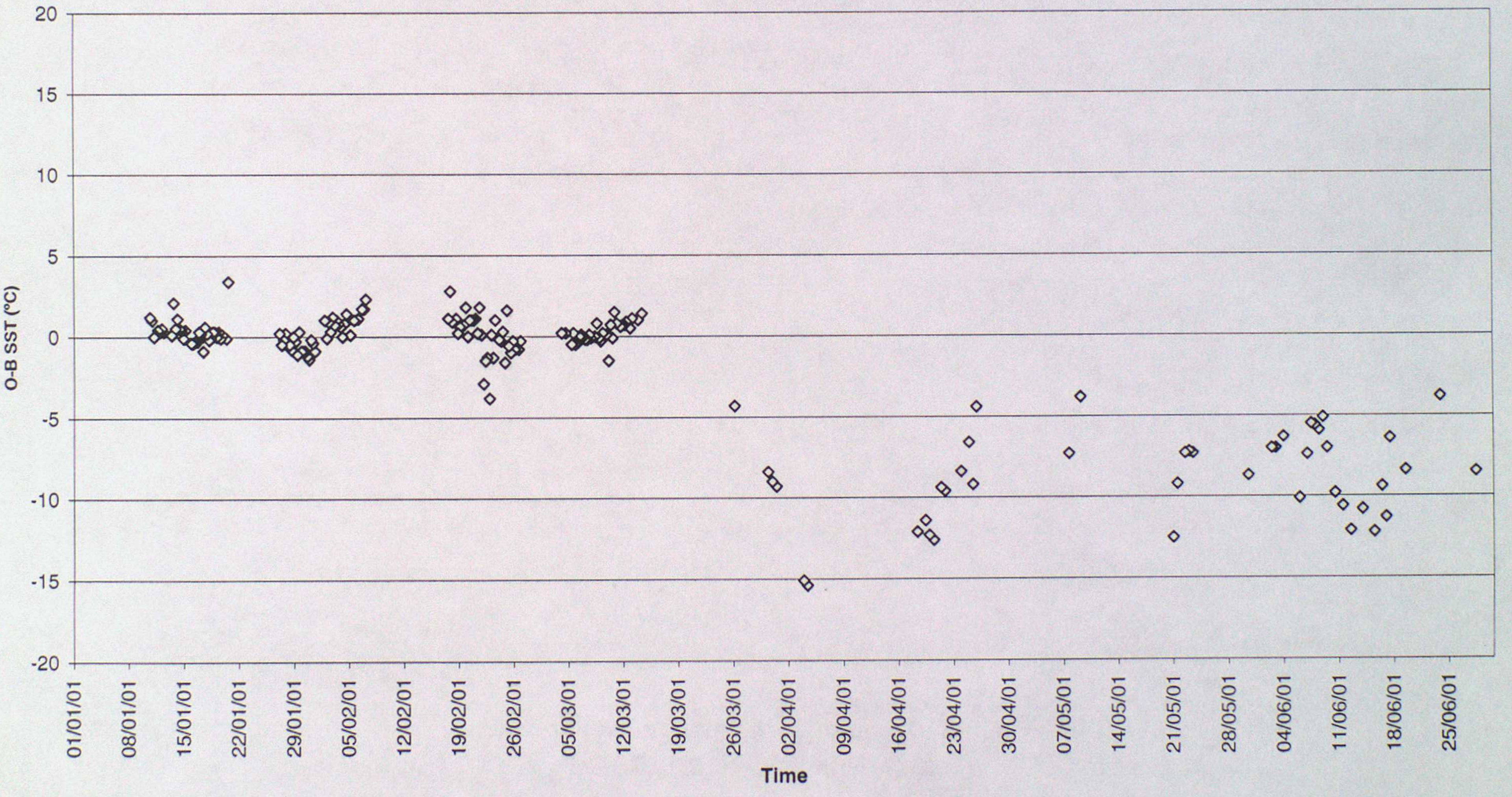
O-B SST (°C) for identifier VRRD
Number of obs. plotted = 62    Number of outliers = 0

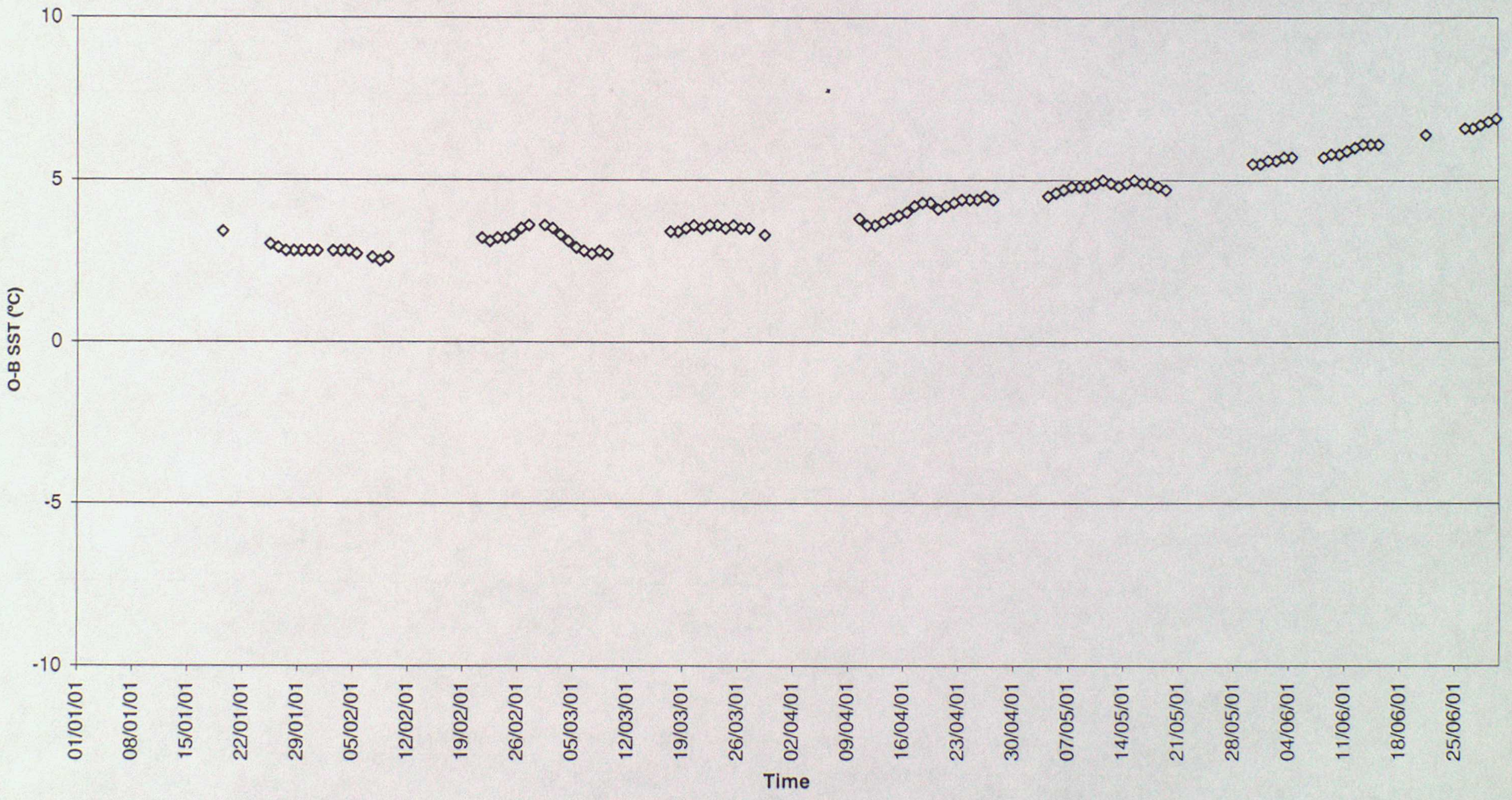


**O-B SST (°C) for identifier V2PB9**
**Number of obs. plotted = 86    Number of outliers = 0**

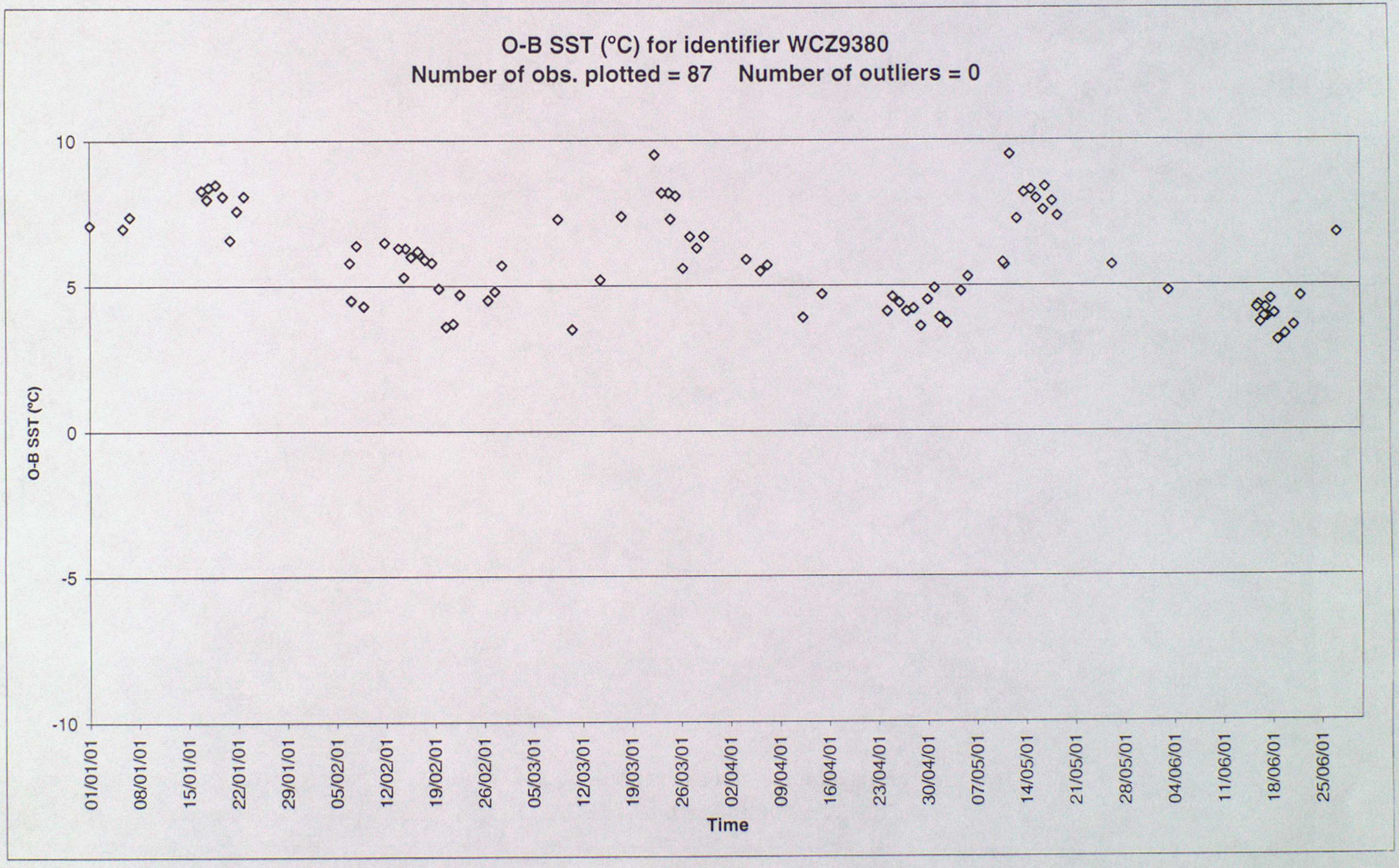


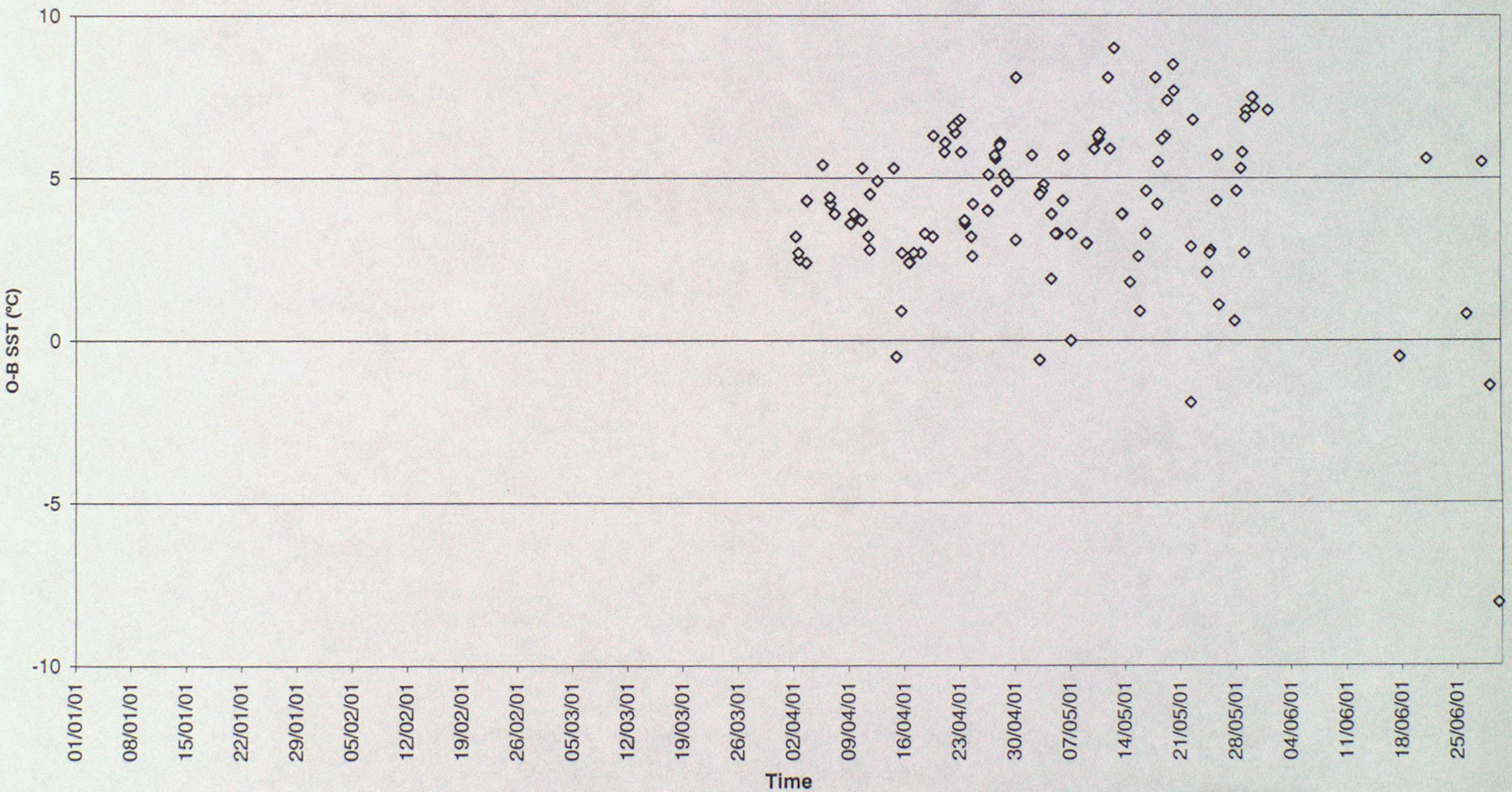
O-B SST (°C) for identifier V7AT5
Number of obs. plotted = 182    Number of outliers = 0



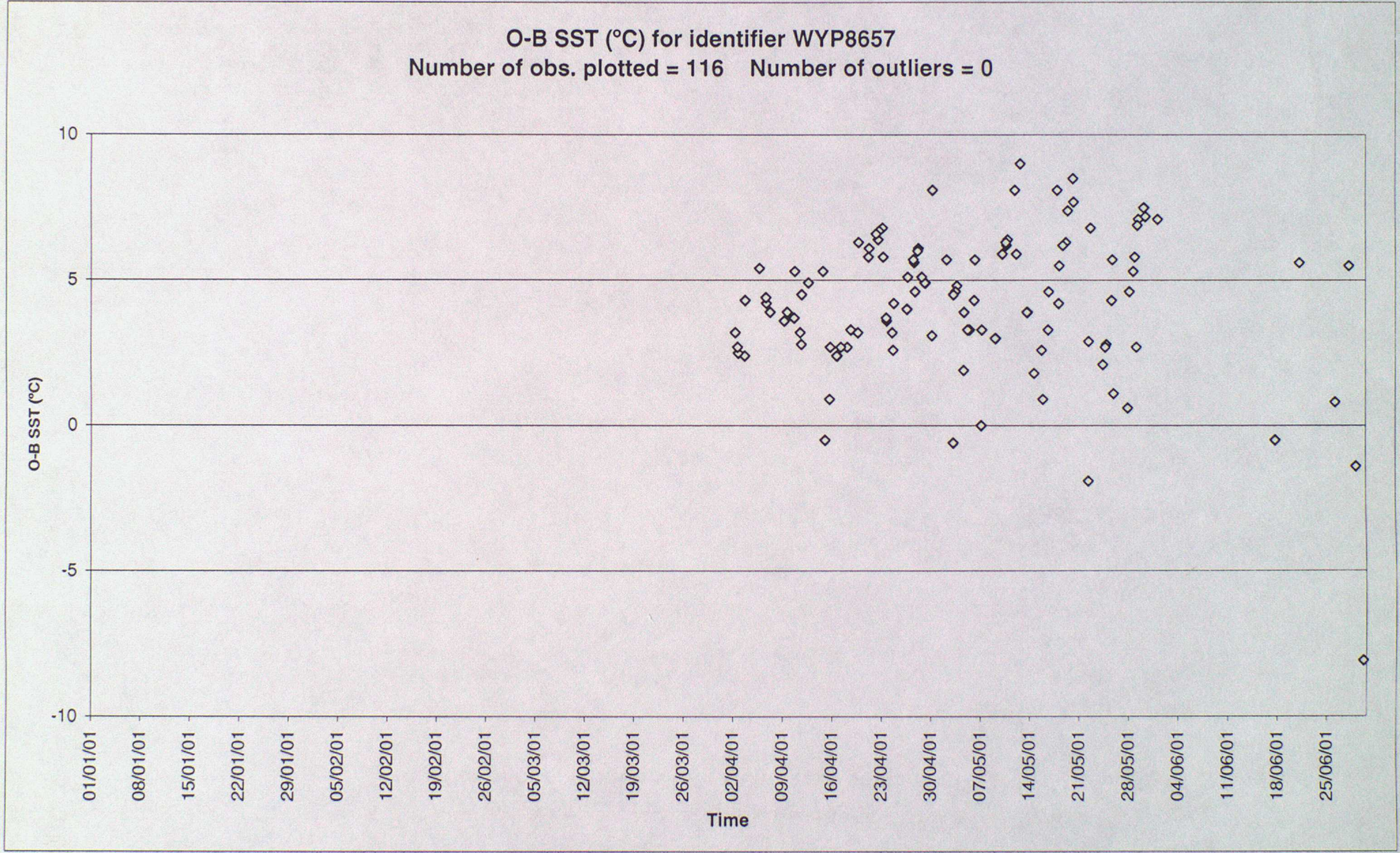


O-B SST (ºC) for identifier V7CN8
Number of obs. plotted = 97    Number of outliers = 0

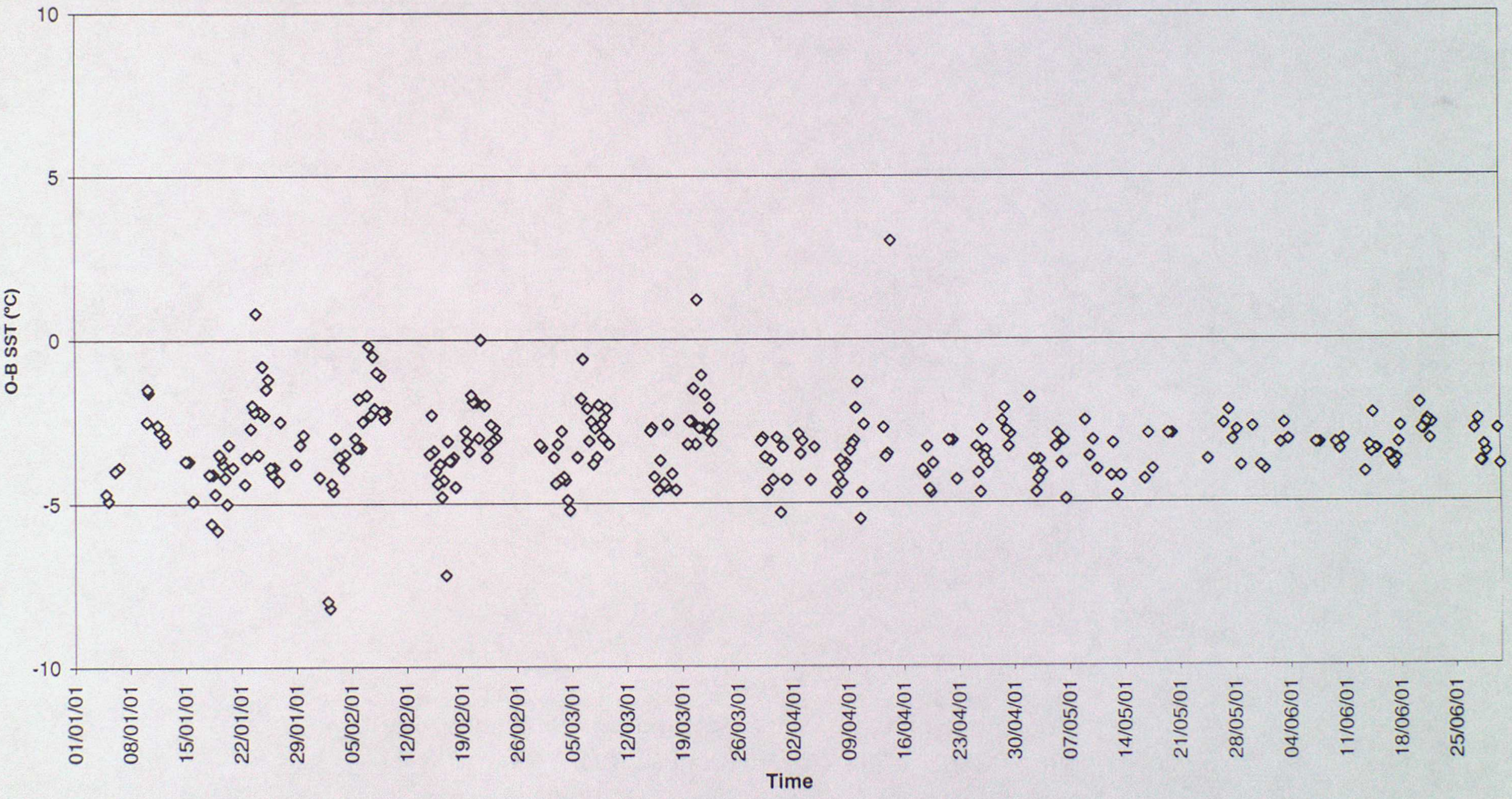

O-B SST (°C) for identifier WCZ9380
Number of obs. plotted = 87    Number of outliers = 0
O-B SST (°C)
10
5
0
-5
-10
01/01/01
08/01/01
15/01/01
22/01/01
29/01/01
05/02/01
12/02/01
19/02/01
26/02/01
05/03/01
12/03/01
19/03/01
26/03/01
02/04/01
09/04/01
16/04/01
23/04/01
30/04/01
07/05/01
14/05/01
21/05/01
28/05/01
04/06/01
11/06/01
18/06/01
25/06/01
Time


O-B SST (°C) for identifier WYP8657

Number of obs. plotted = 116    Number of outliers = 0

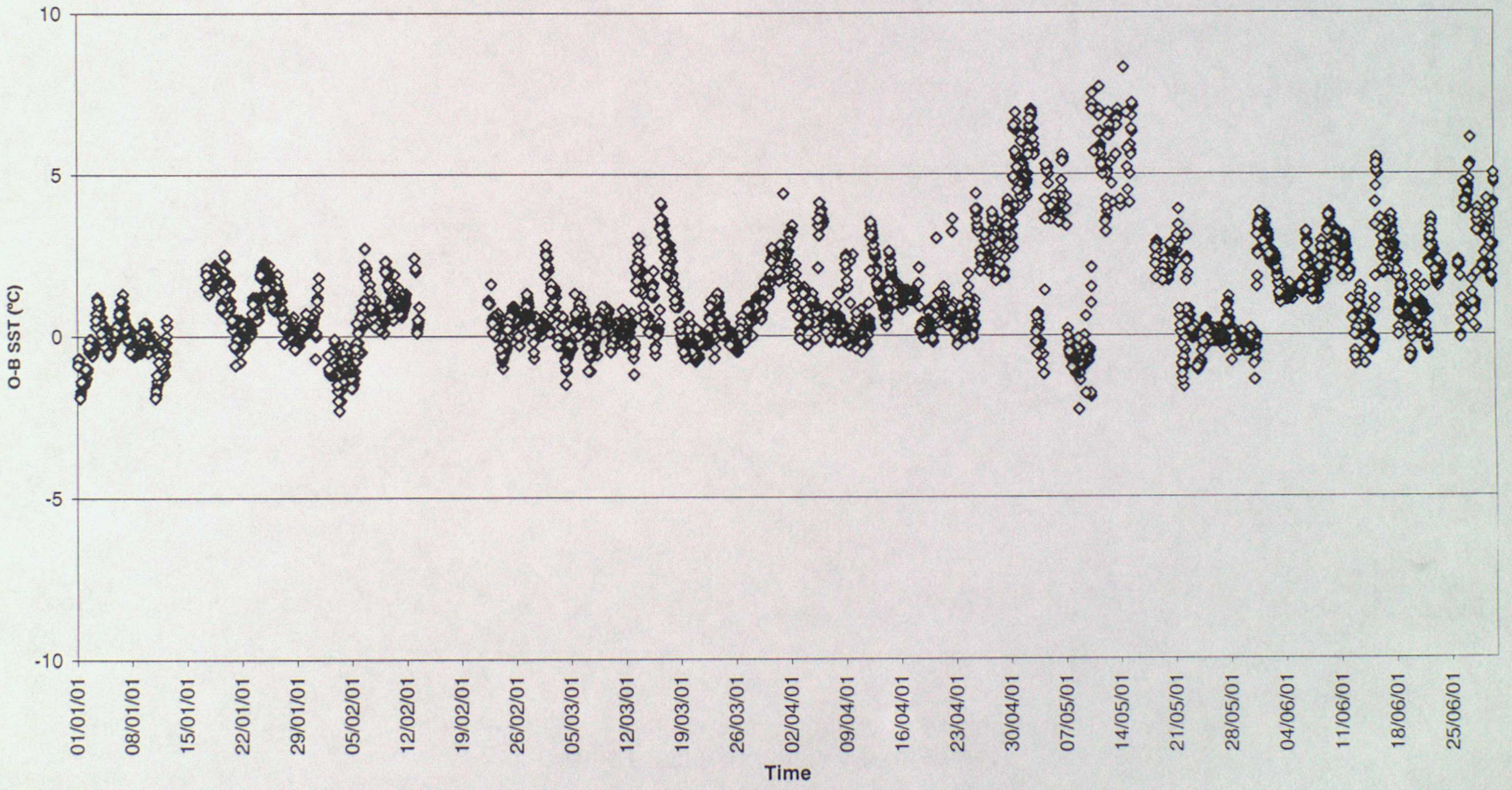


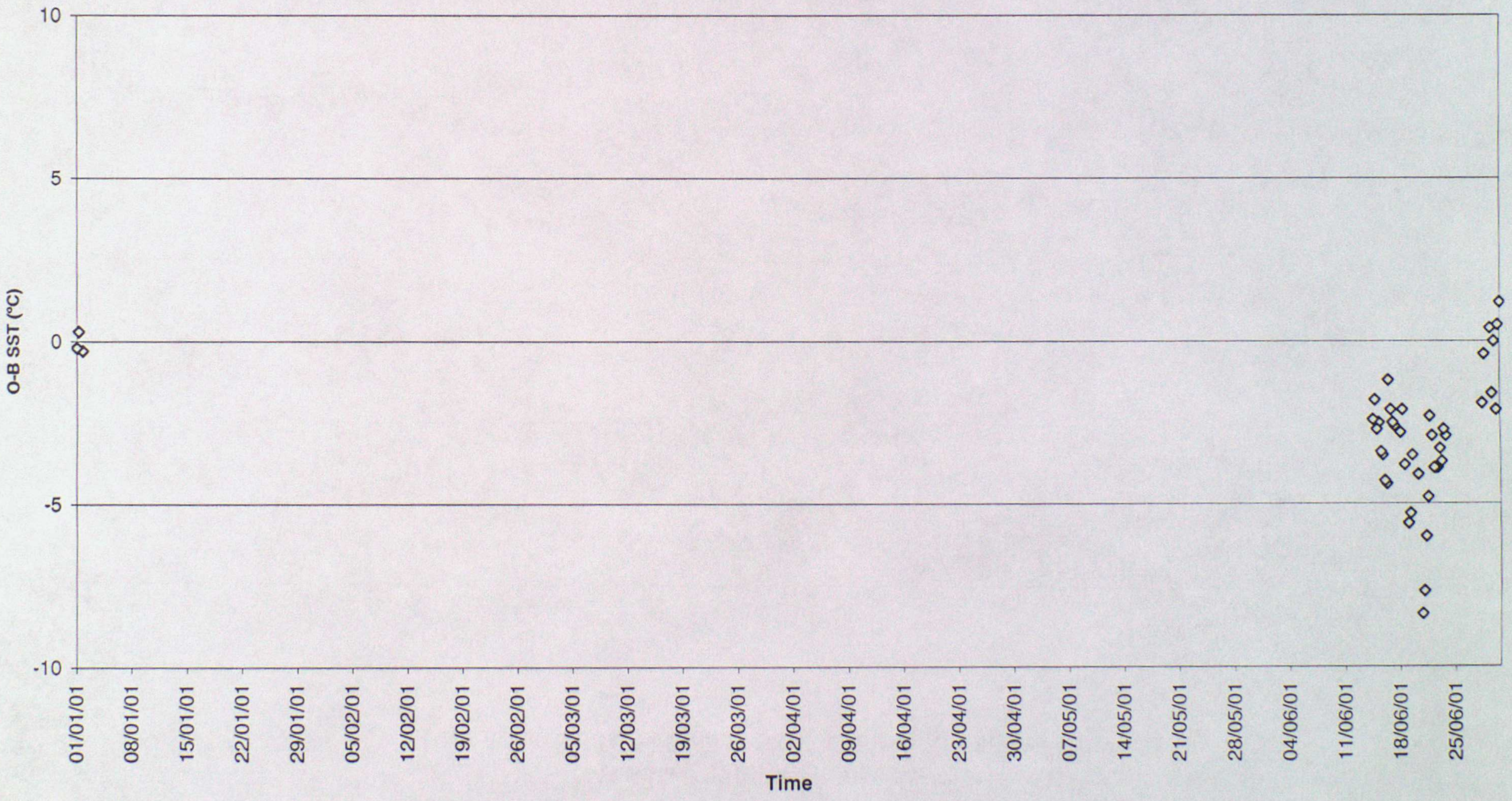
O-B SST (°C) for identifier WYP8657
Number of obs. plotted = 116    Number of outliers = 0



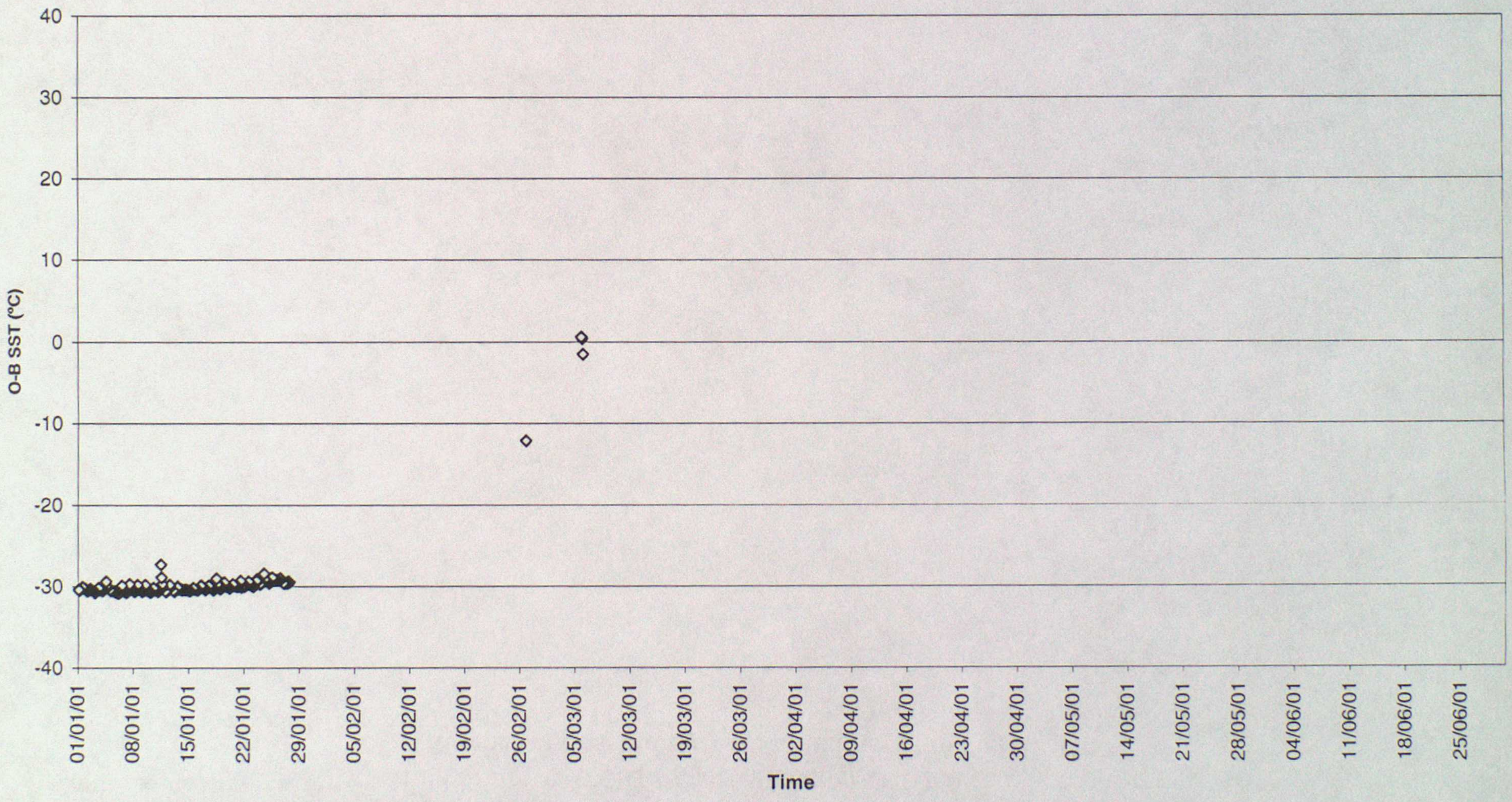
O-B SST (°C) for identifier WZJD
Number of obs. plotted = 273    Number of outliers = 0

O-B SST (°C) for identifier Y3CH
Number of obs. plotted = 3208    Number of outliers = 2

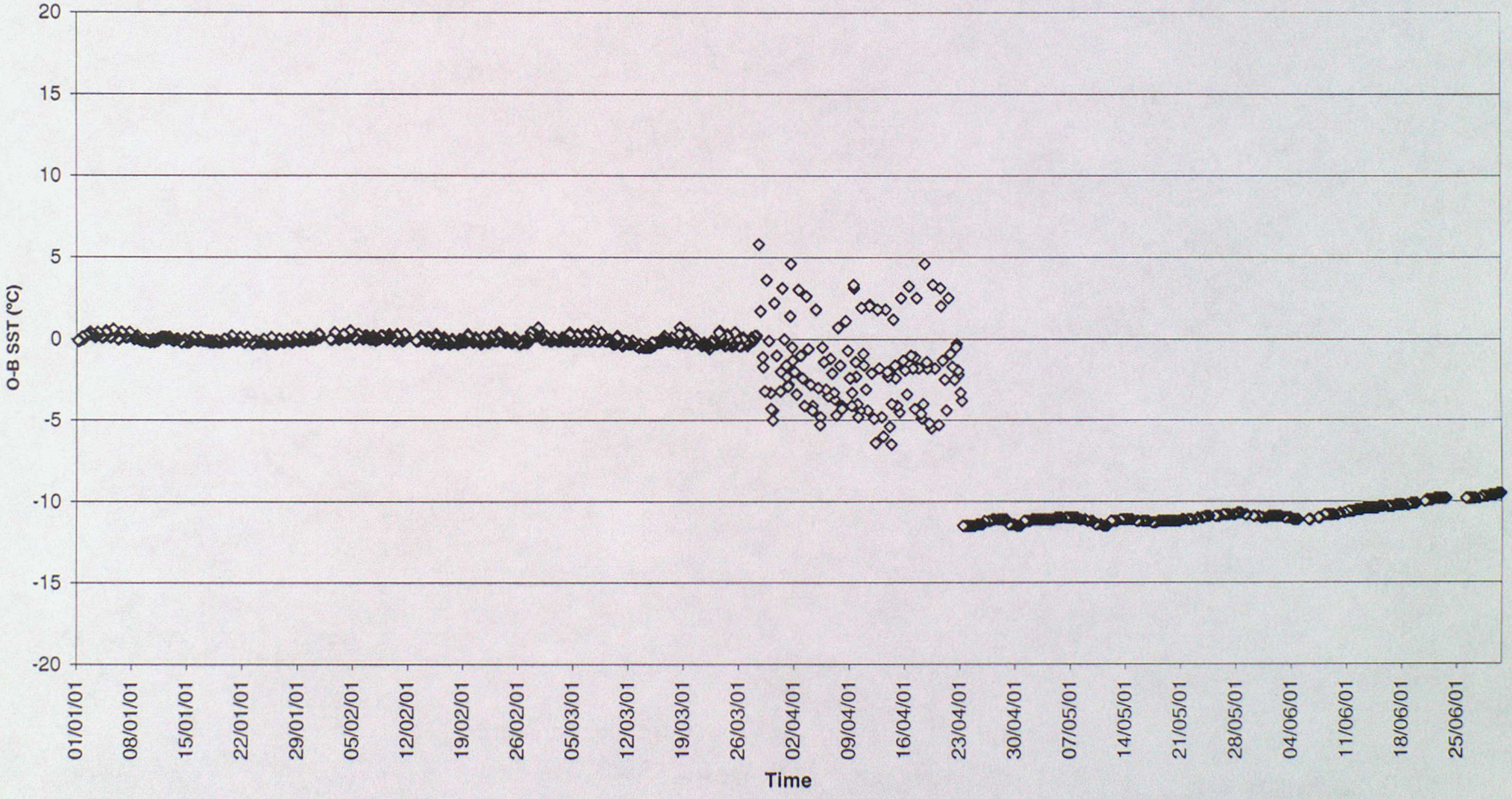




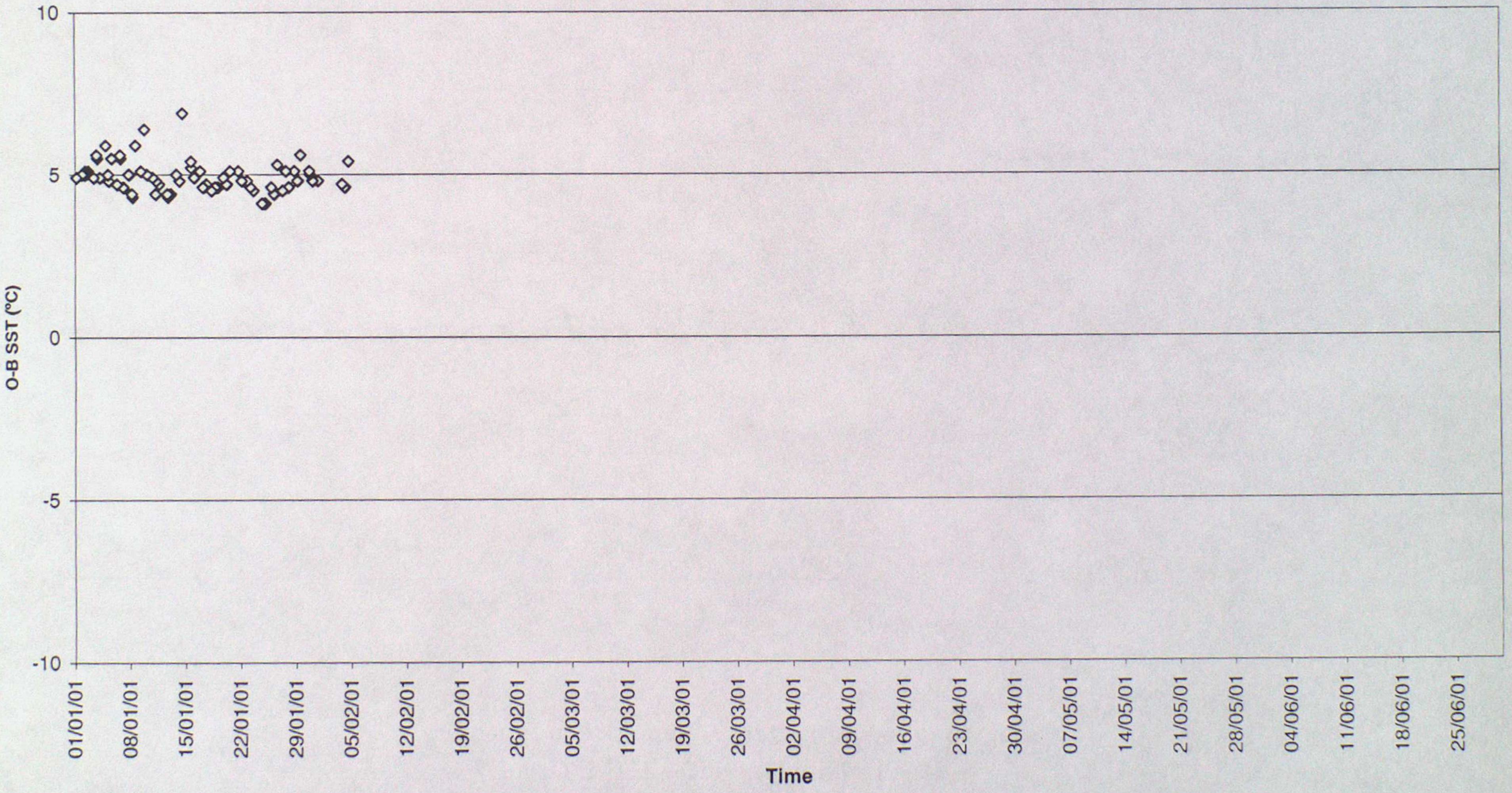
O-B SST (°C) for identifier ZCBJ6
Number of obs. plotted = 43    Number of outliers = 0



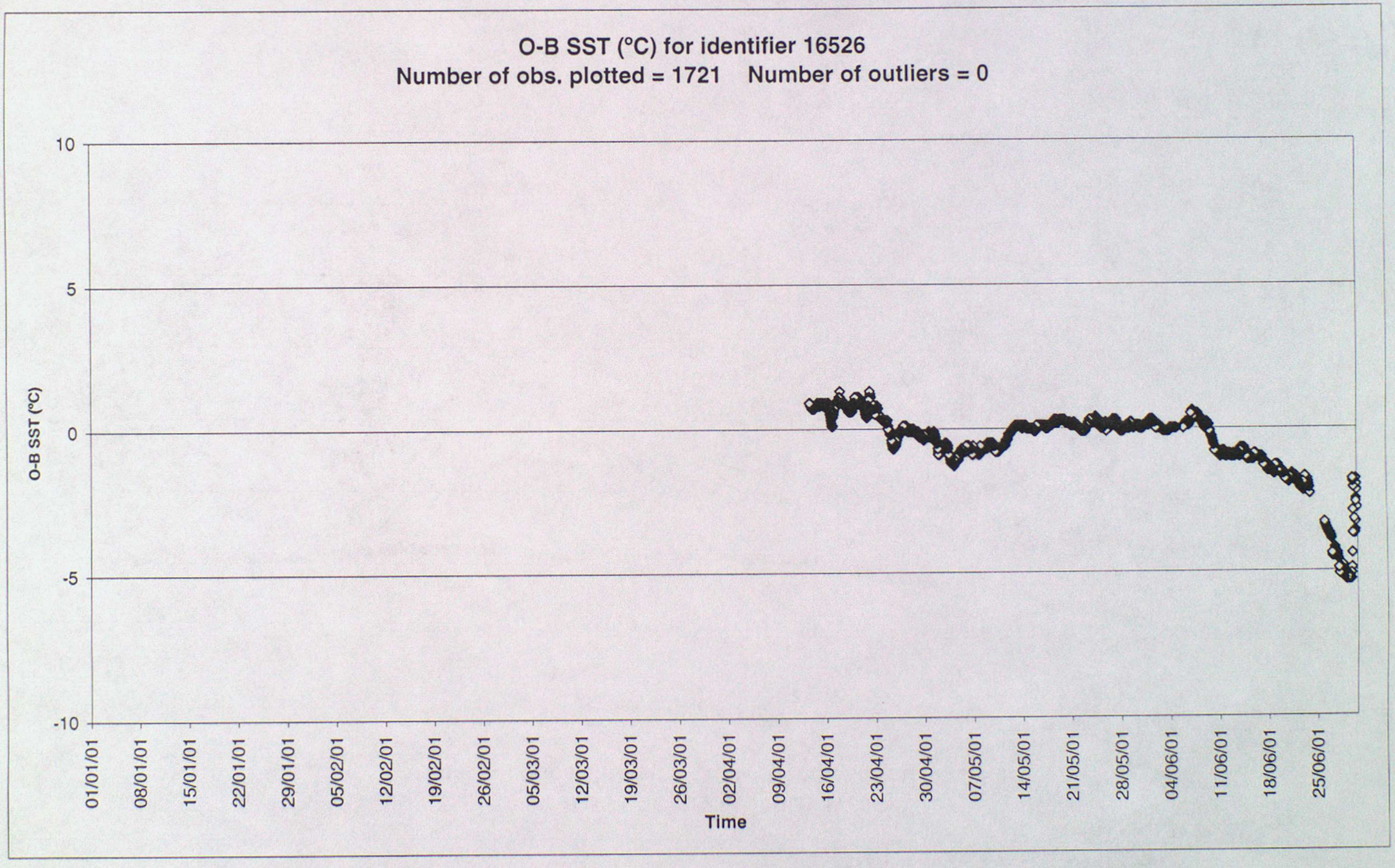
O-B SST (°C) for identifier 14559
Number of obs. plotted = 242    Number of outliers = 0



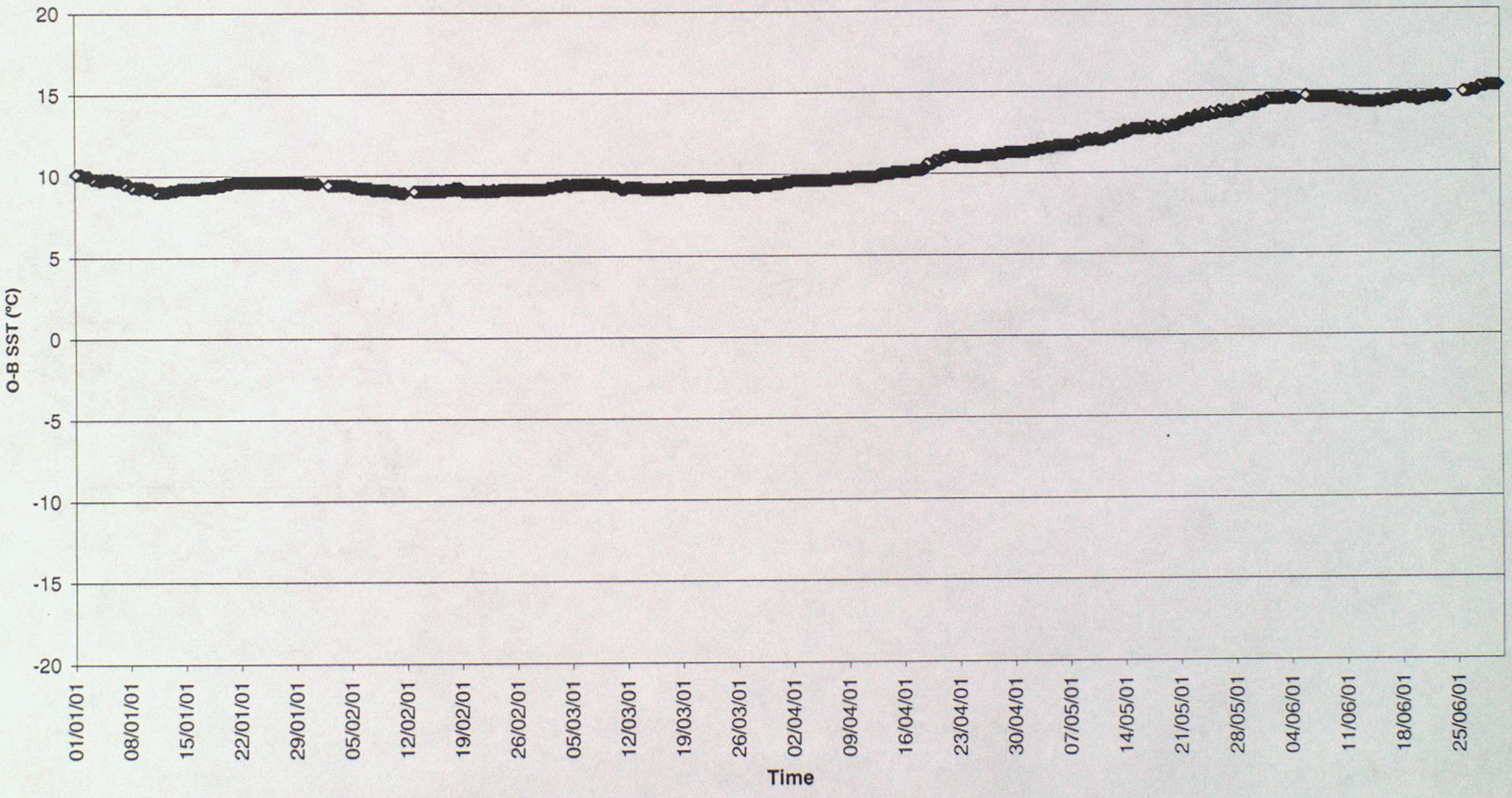
O-B SST (°C) for identifier 15501
Number of obs. plotted = 1072    Number of outliers = 0


O-B SST (°C) for identifier 15537

Number of obs. plotted = 85    Number of outliers = 0

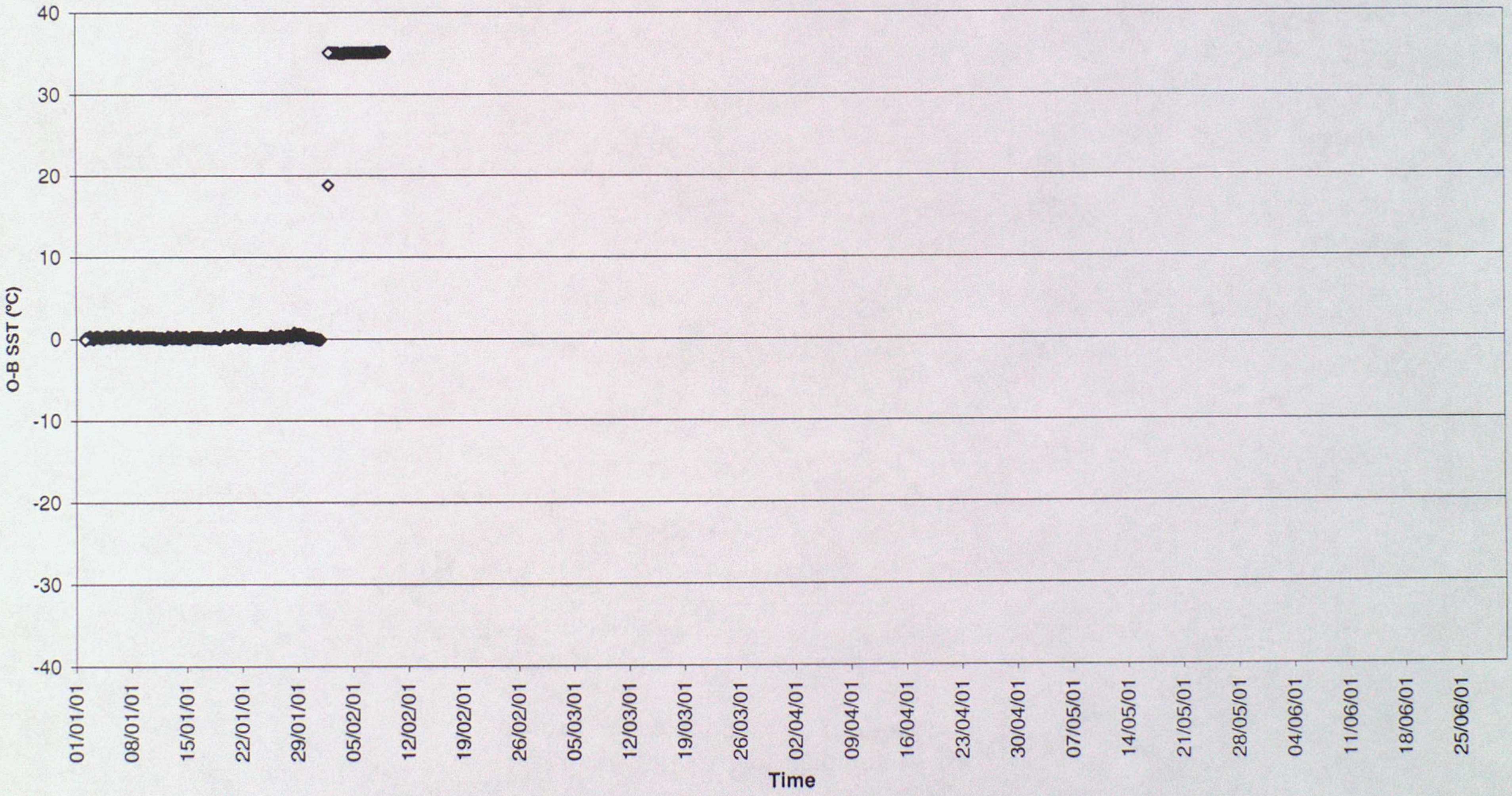


O-B SST (°C) for identifier 16526
Number of obs. plotted = 1721    Number of outliers = 0

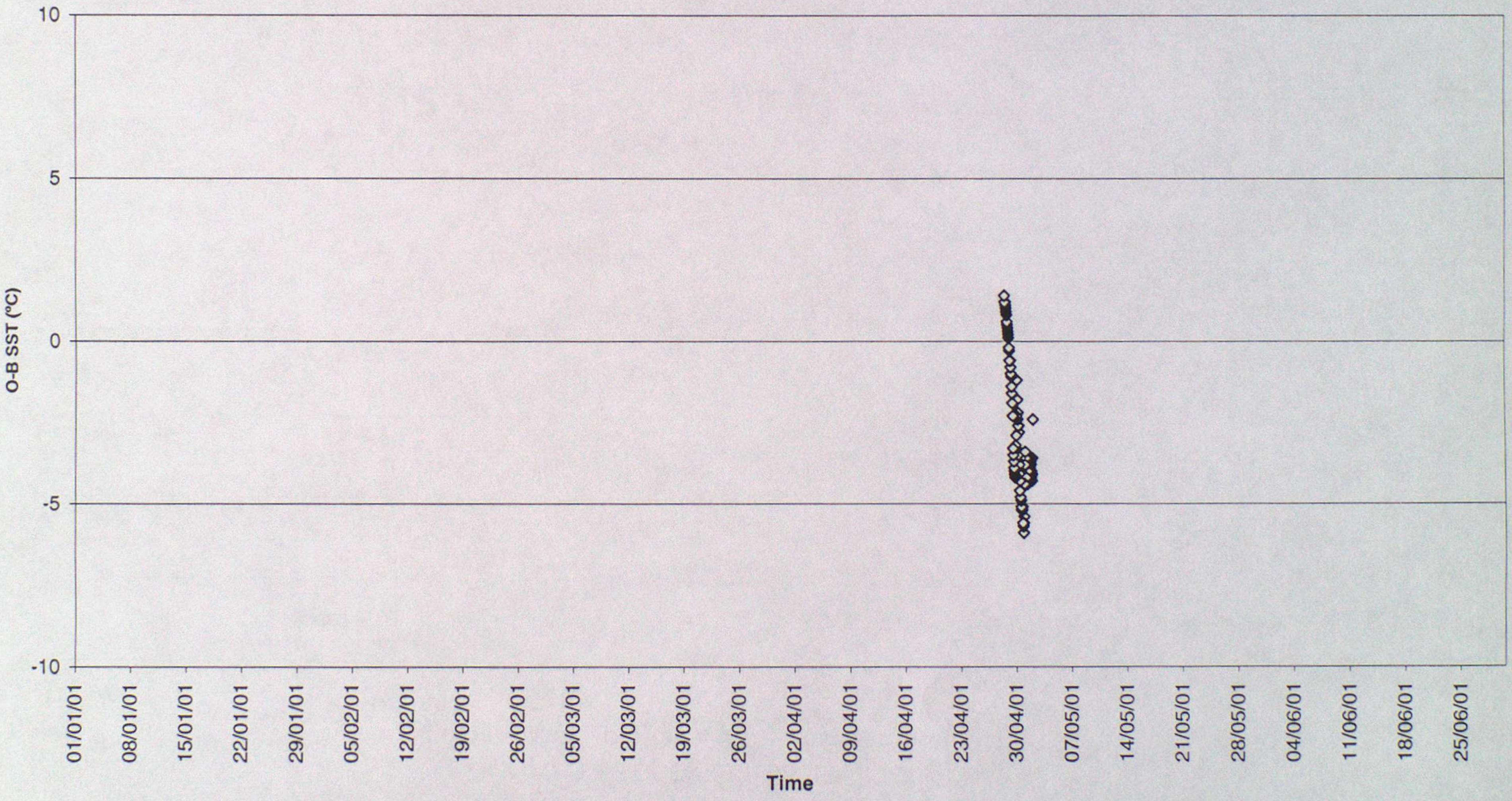


O-B SST (°C) for identifier 17635
Number of obs. plotted = 1738    Number of outliers = 0

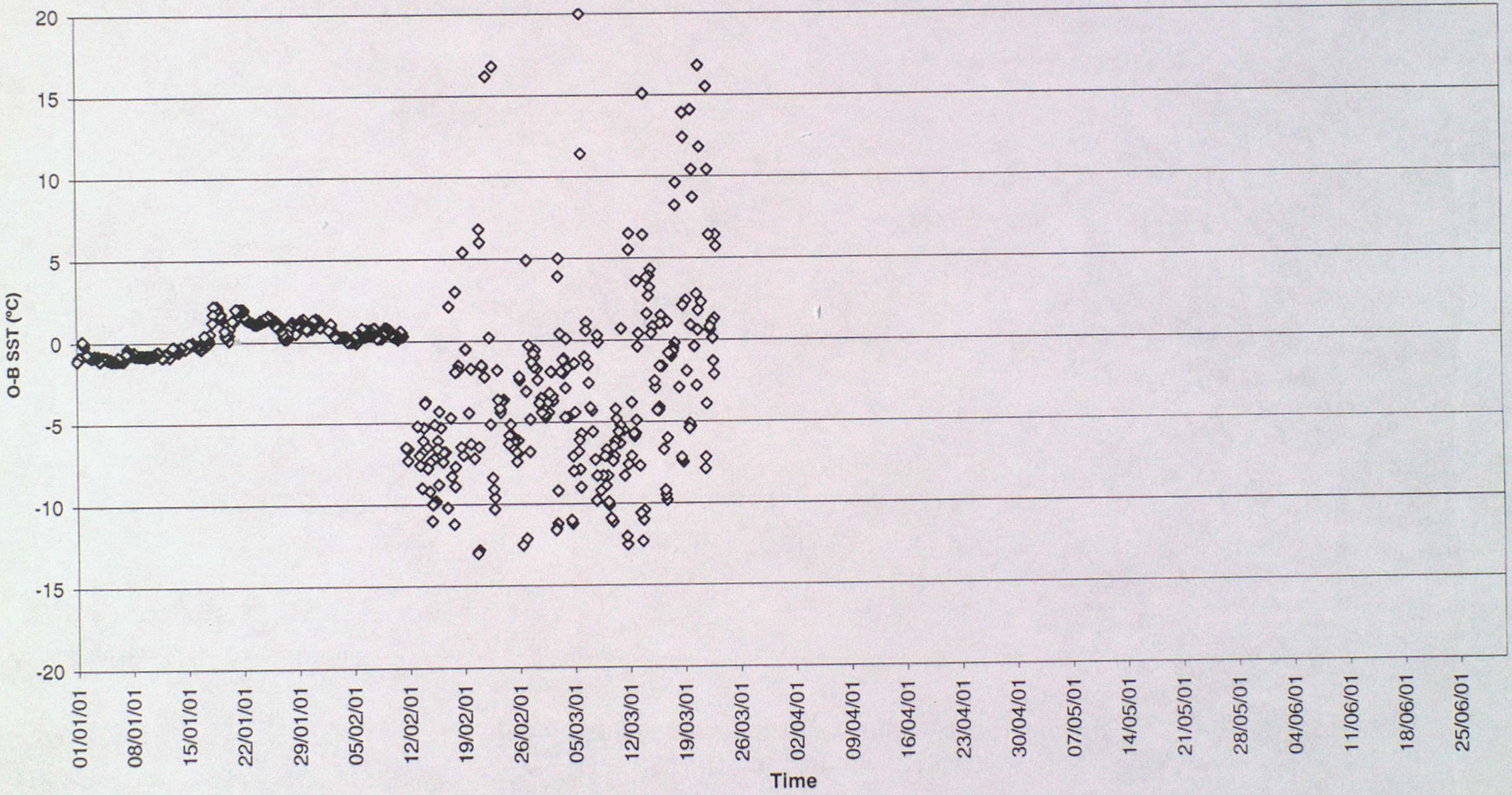
O-B SST (°C) for identifier 17645
Number of obs. plotted = 827    Number of outliers = 0



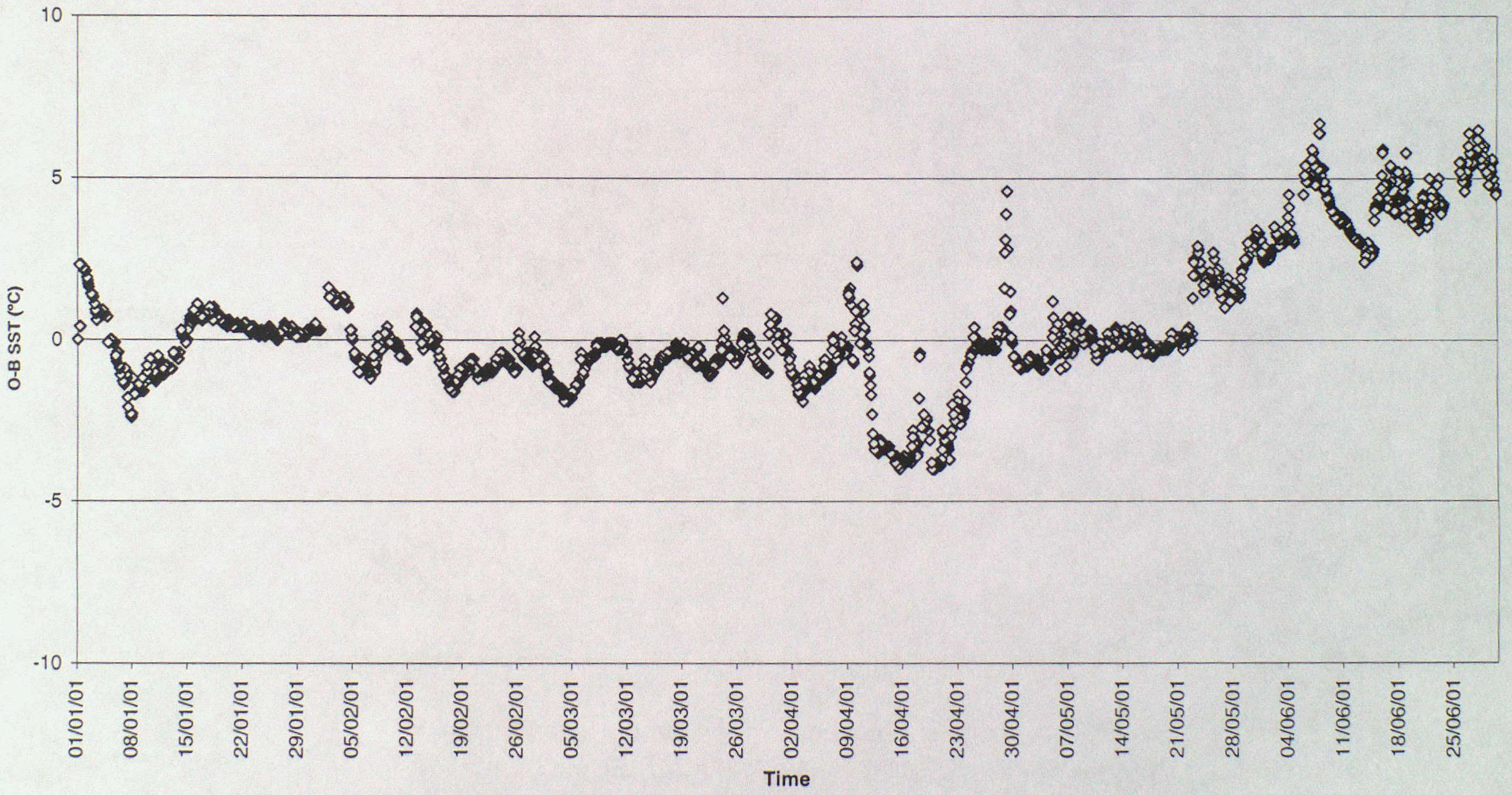
O-B SST (°C) for identifier 21599
Number of obs. plotted = 87    Number of outliers = 0



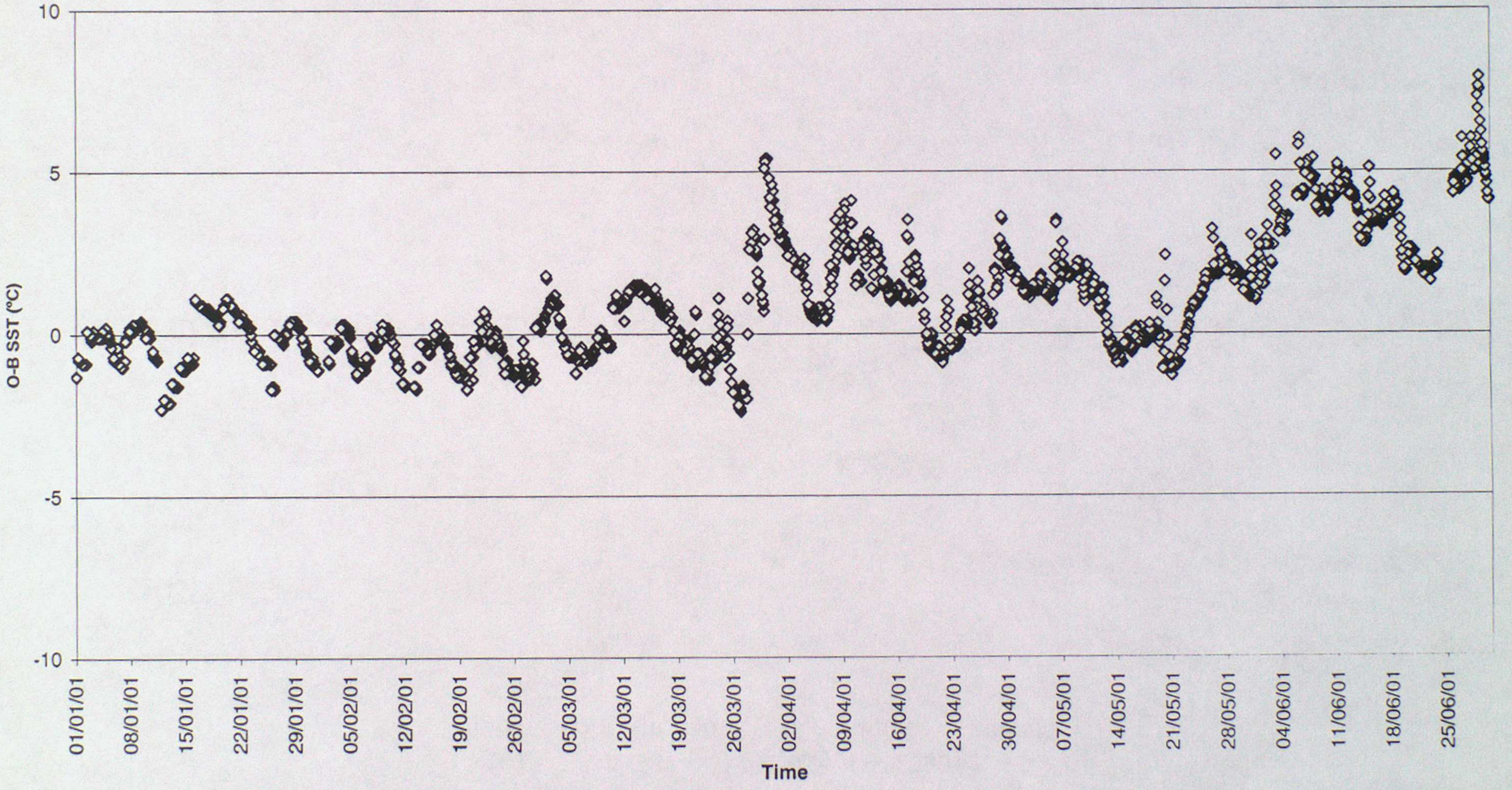
O-B SST (°C) for identifier 21903
Number of obs. plotted = 645    Number of outliers = 0



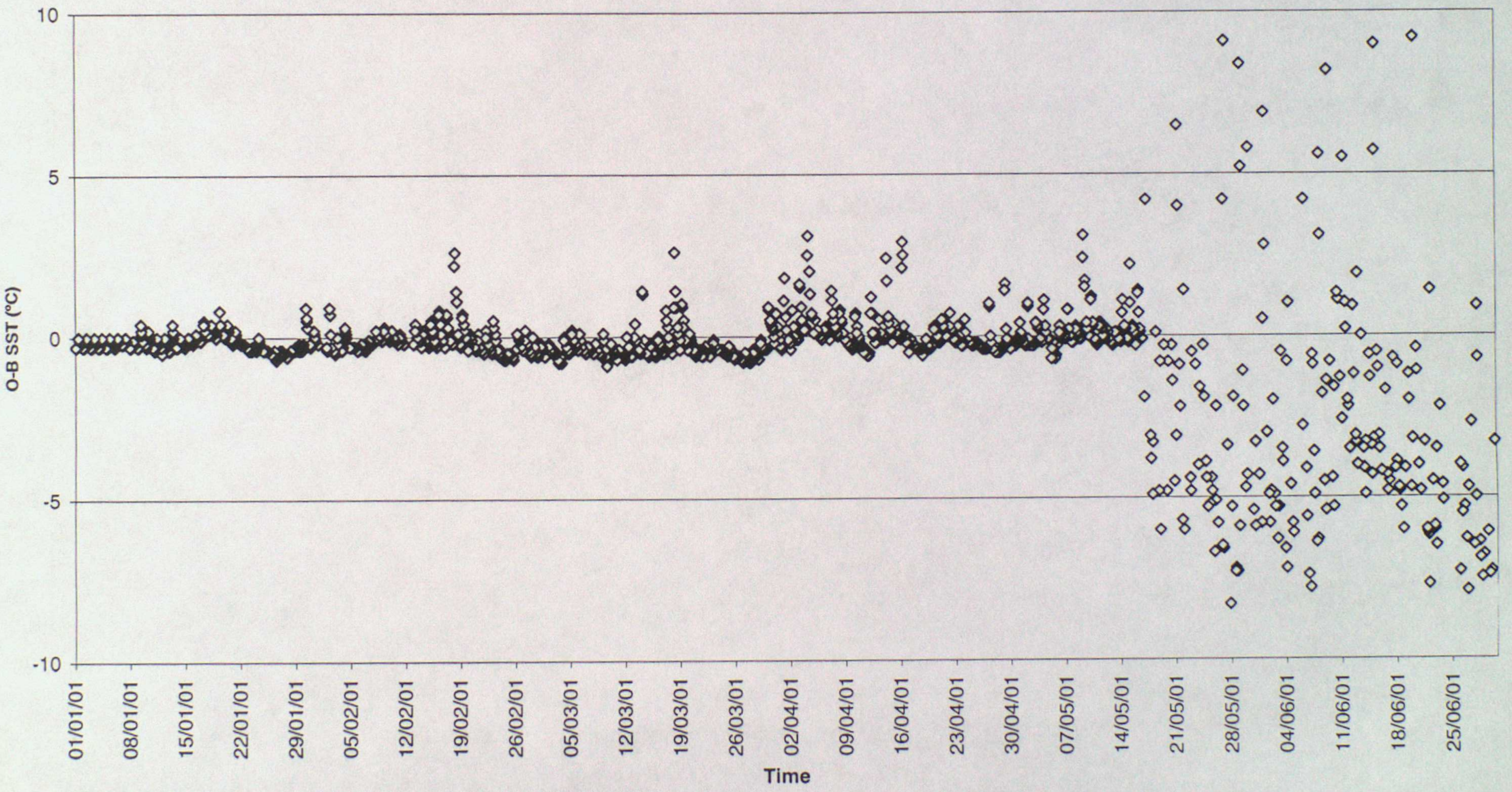
O-B SST (°C) for identifier 21904
Number of obs. plotted = 1912    Number of outliers = 0



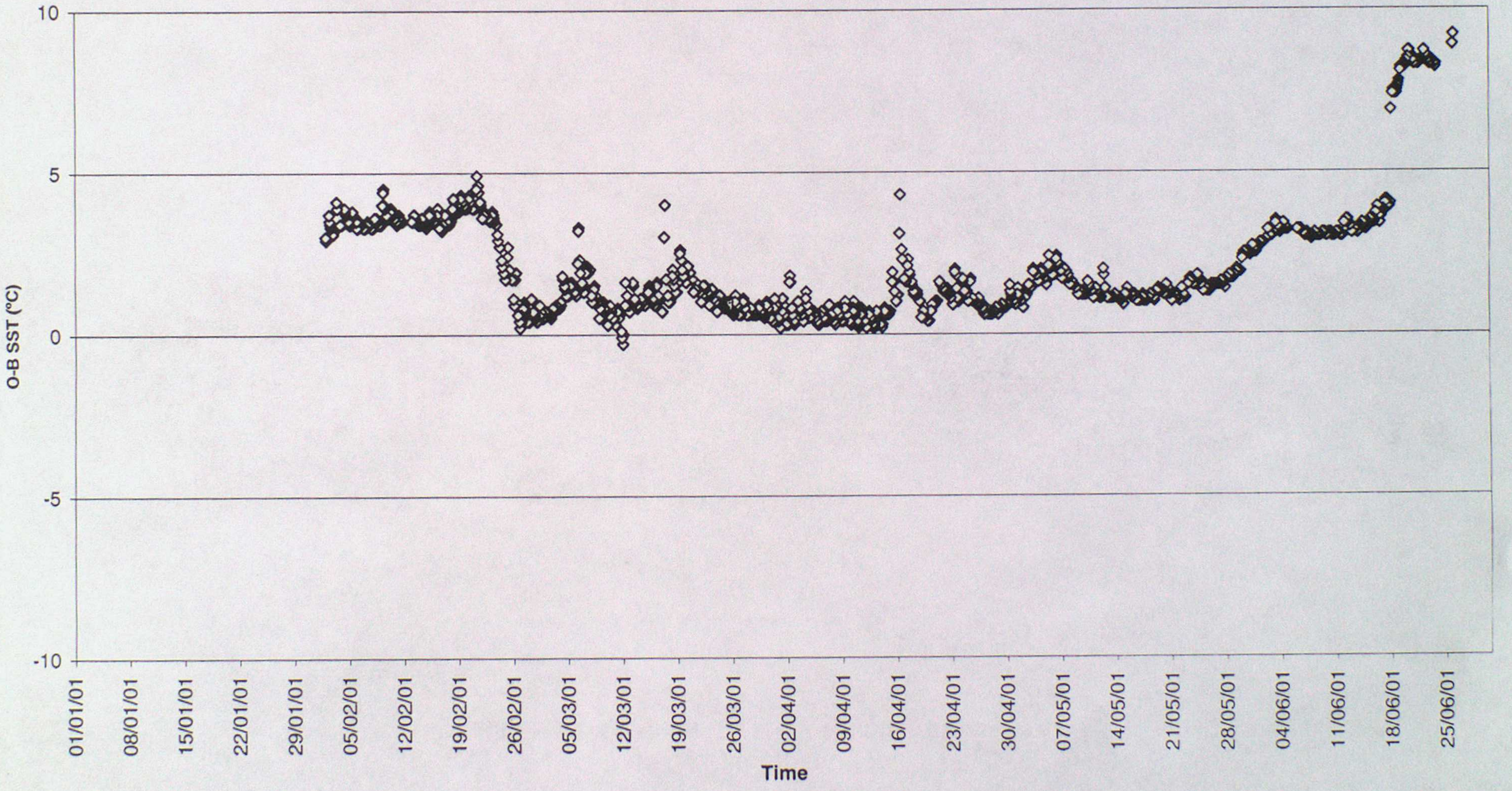
O-B SST (°C) for identifier 22913
Number of obs. plotted = 1788    Number of outliers = 2



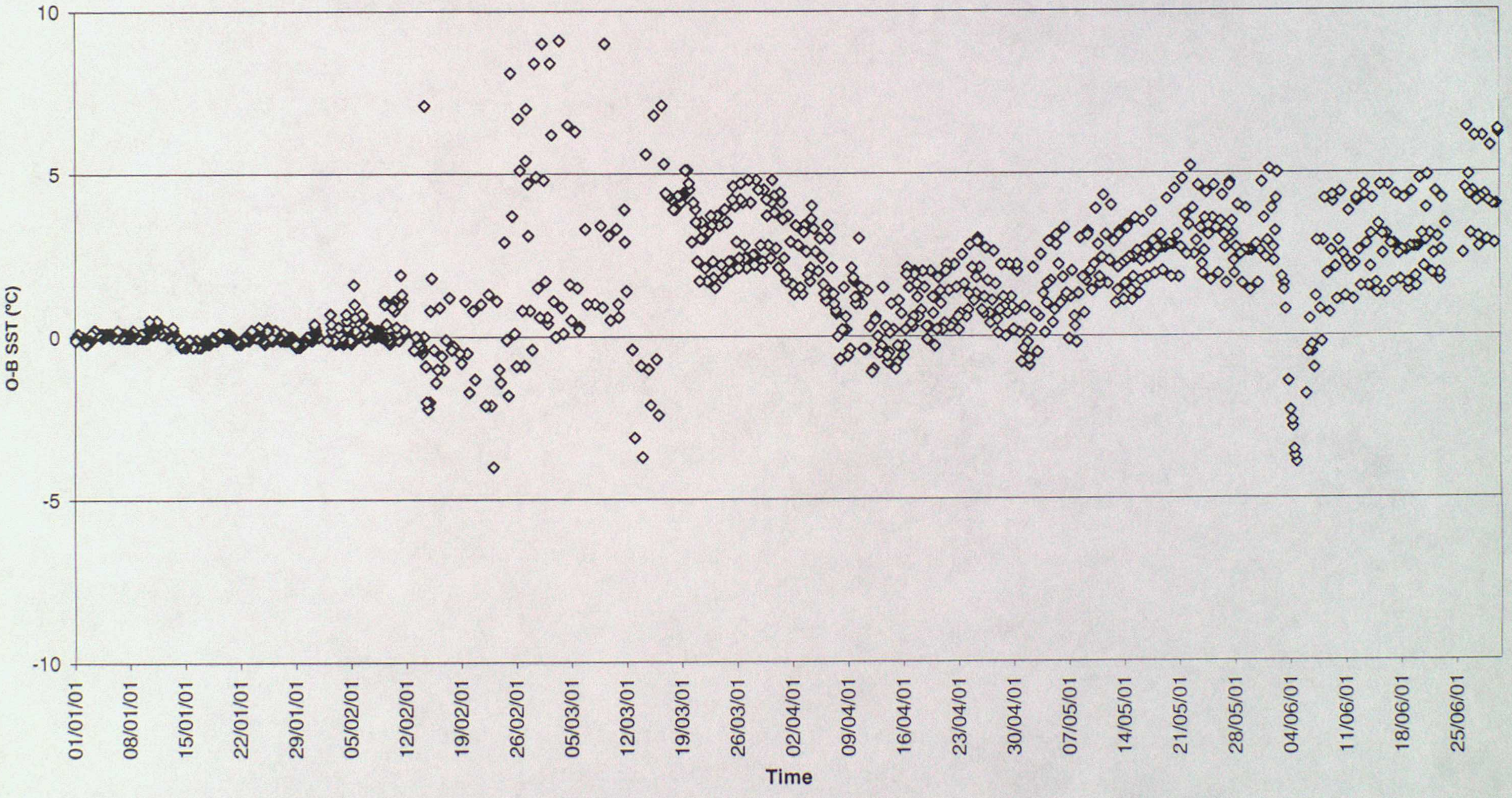
O-B SST (°C) for identifier 23901
Number of obs. plotted = 1315    Number of outliers = 0



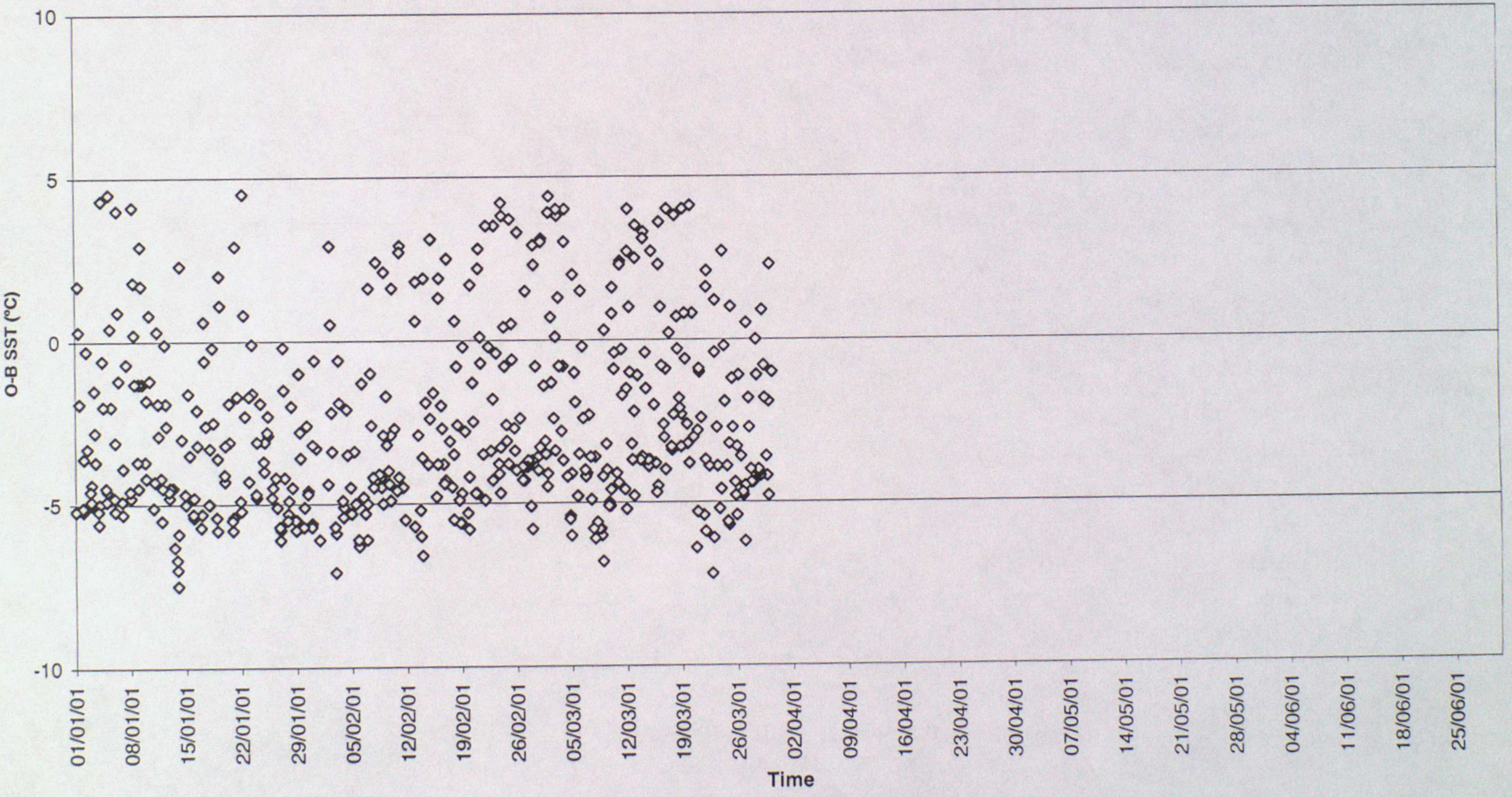
O-B SST (°C) for identifier 23902
Number of obs. plotted = 1168    Number of outliers = 0

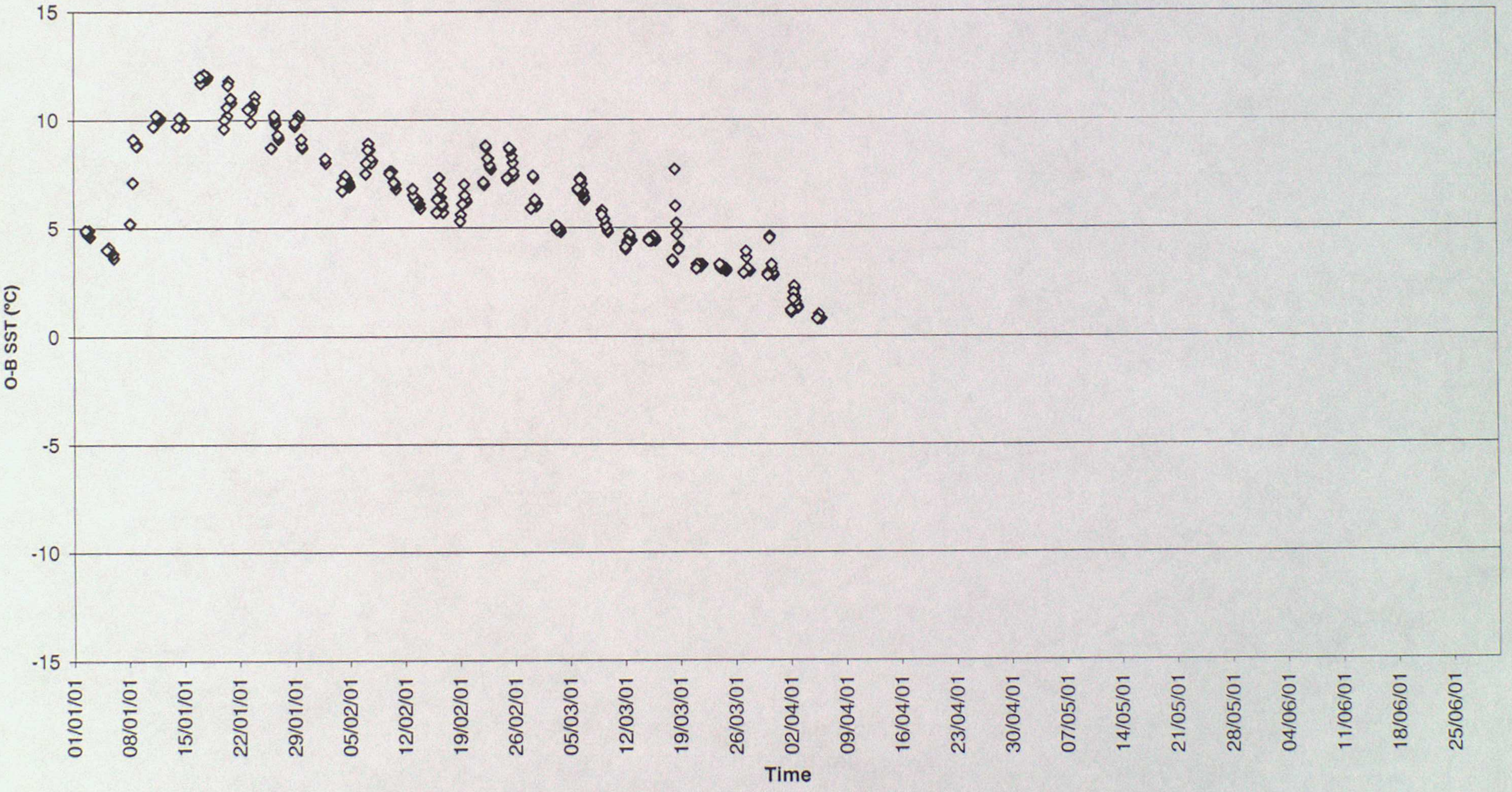


O-B SST (°C) for identifier 23904
Number of obs. plotted = 958    Number of outliers = 1



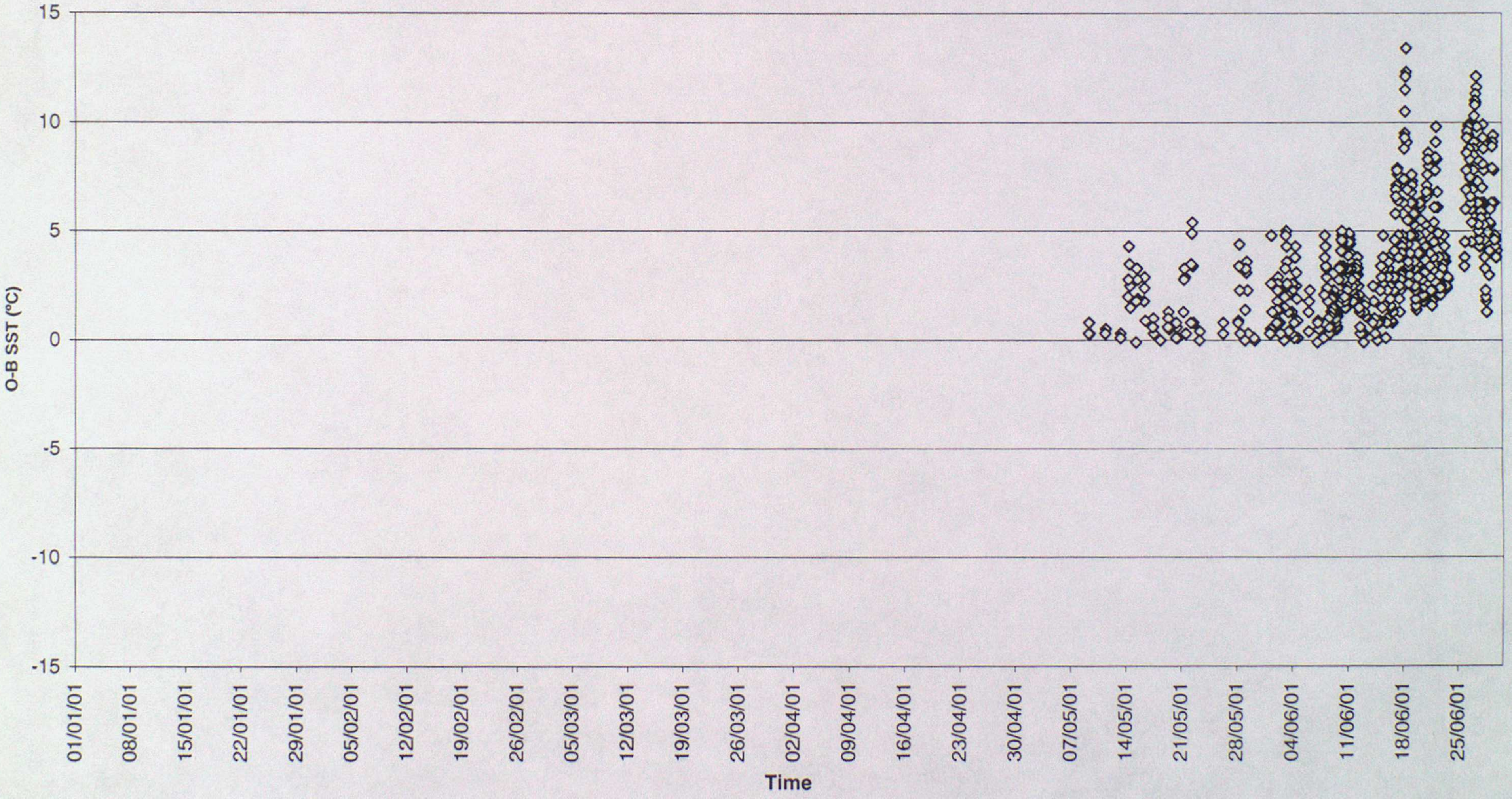
O-B SST (°C) for identifier 23906
Number of obs. plotted = 499    Number of outliers = 0



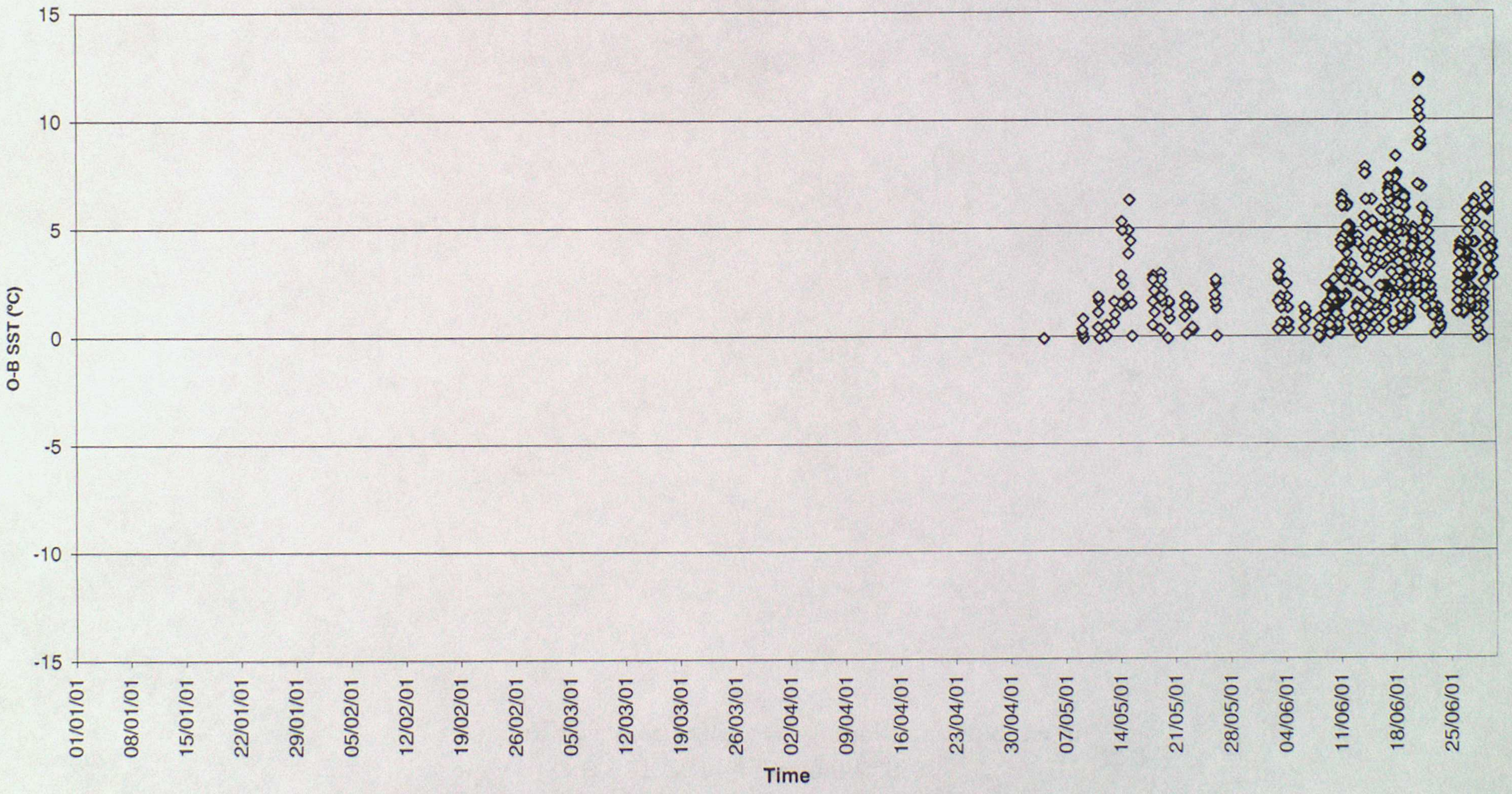


O-B SST (°C) for identifier 23915
Number of obs. plotted = 285    Number of outliers = 0

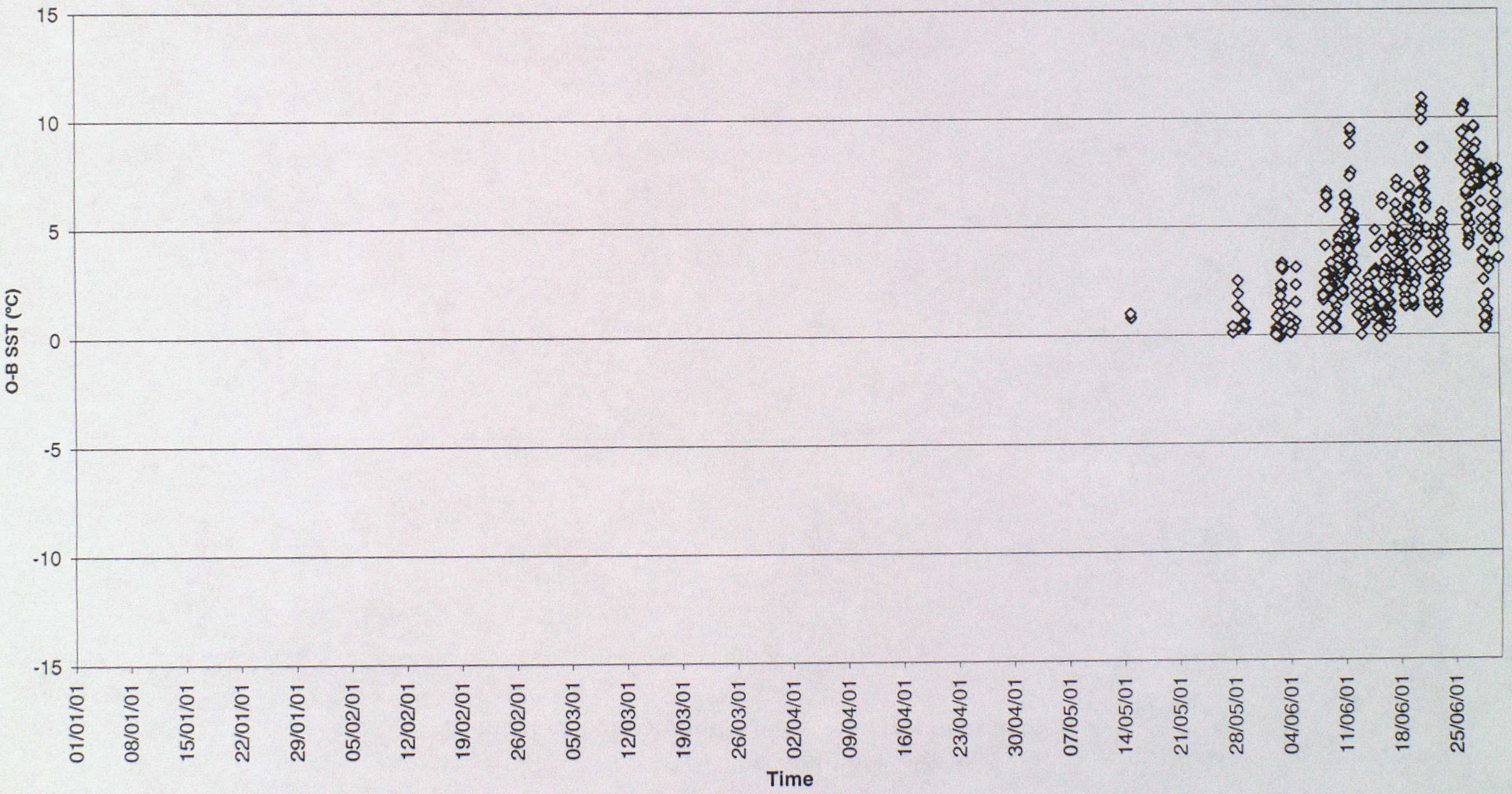
O-B SST (°C) for identifier 25539
Number of obs. plotted = 653    Number of outliers = 0

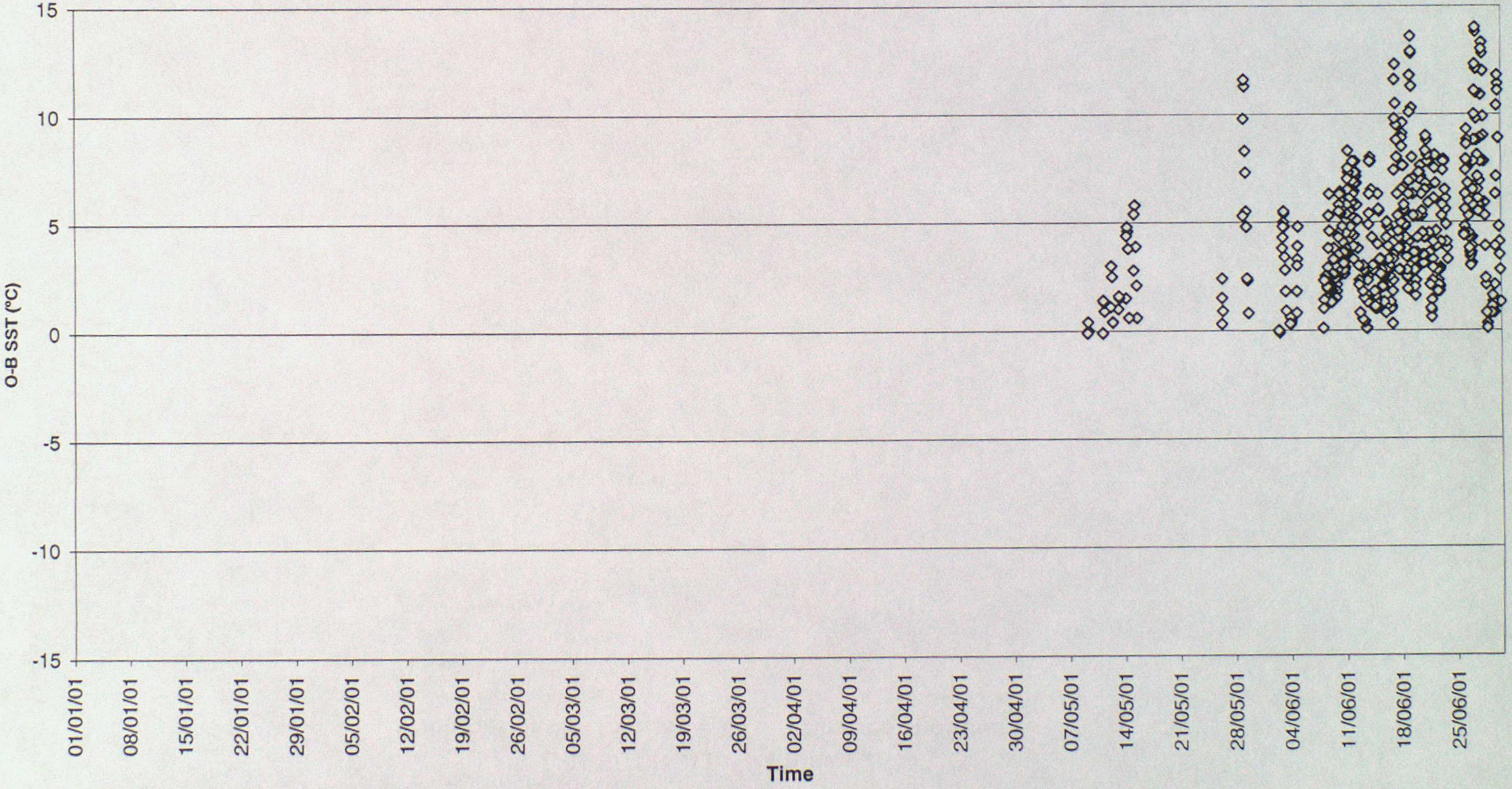


O-B SST (°C) for identifier 25540
Number of obs. plotted = 596    Number of outliers = 0



O-B SST (°C) for identifier 25541
Number of obs. plotted = 591    Number of outliers = 0

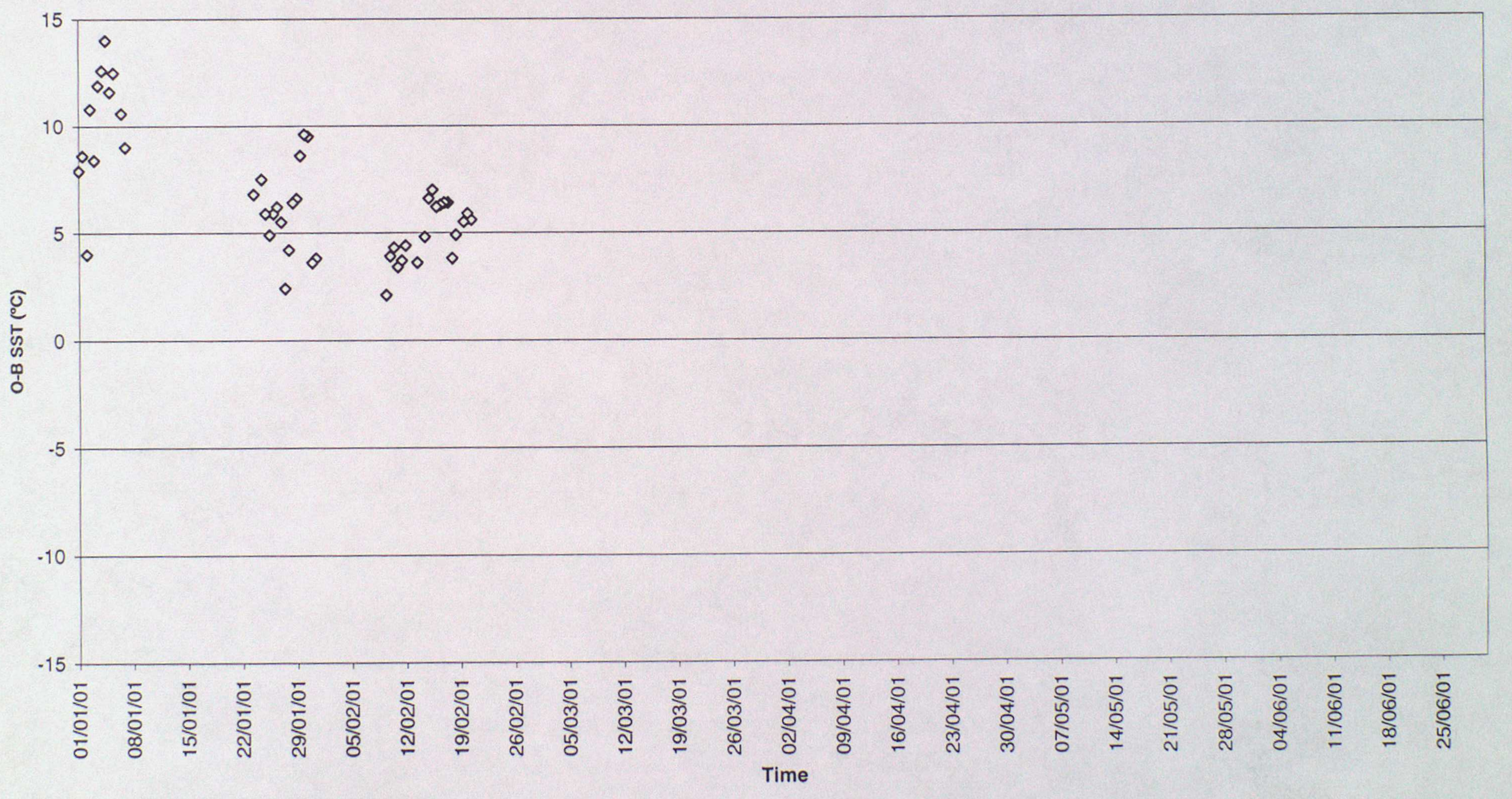




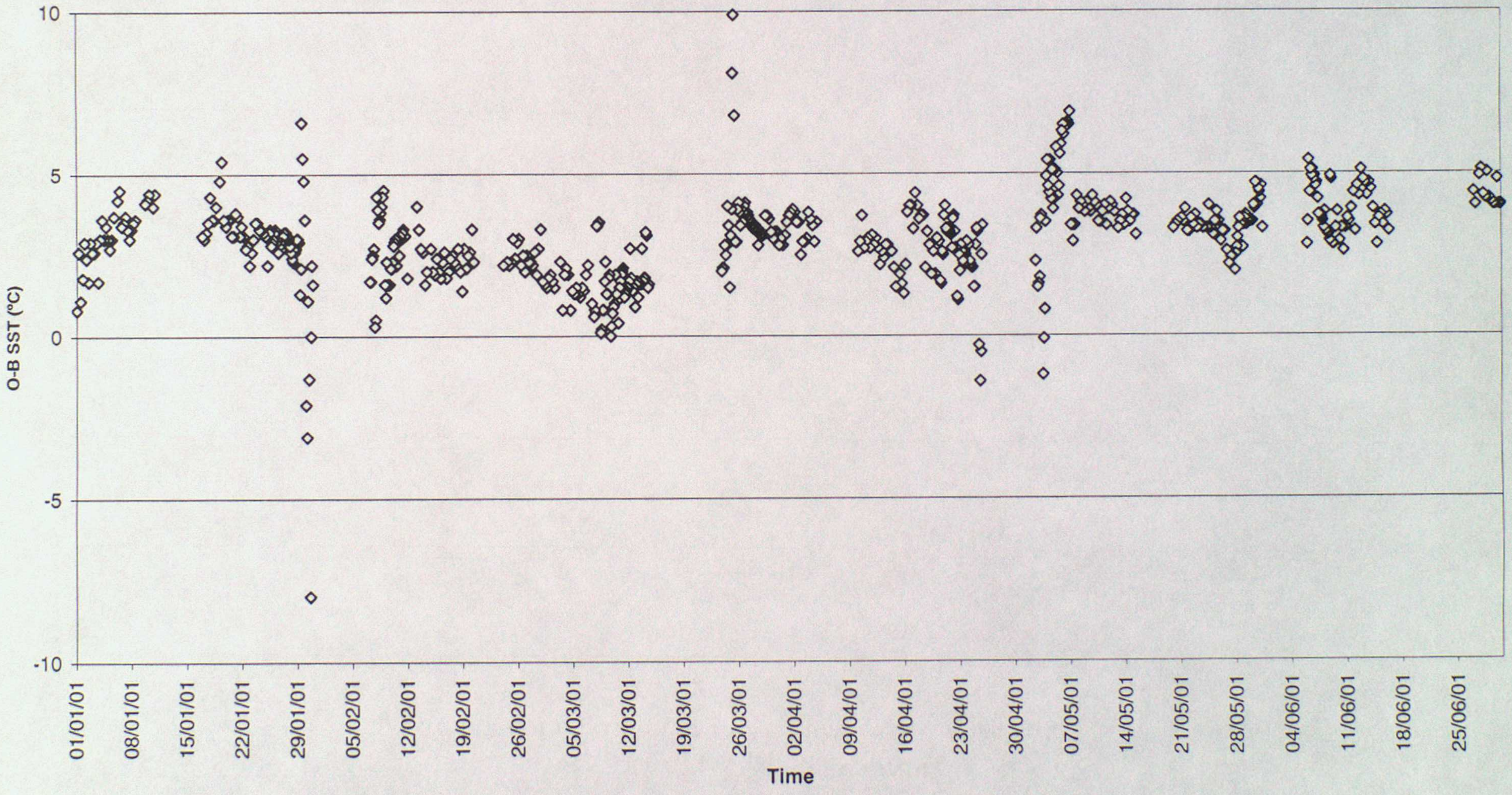
O-B SST (ºC) for identifier 26511
Number of obs. plotted = 627    Number of outliers = 0

## O-B SST (°C) for identifier 3EBW4

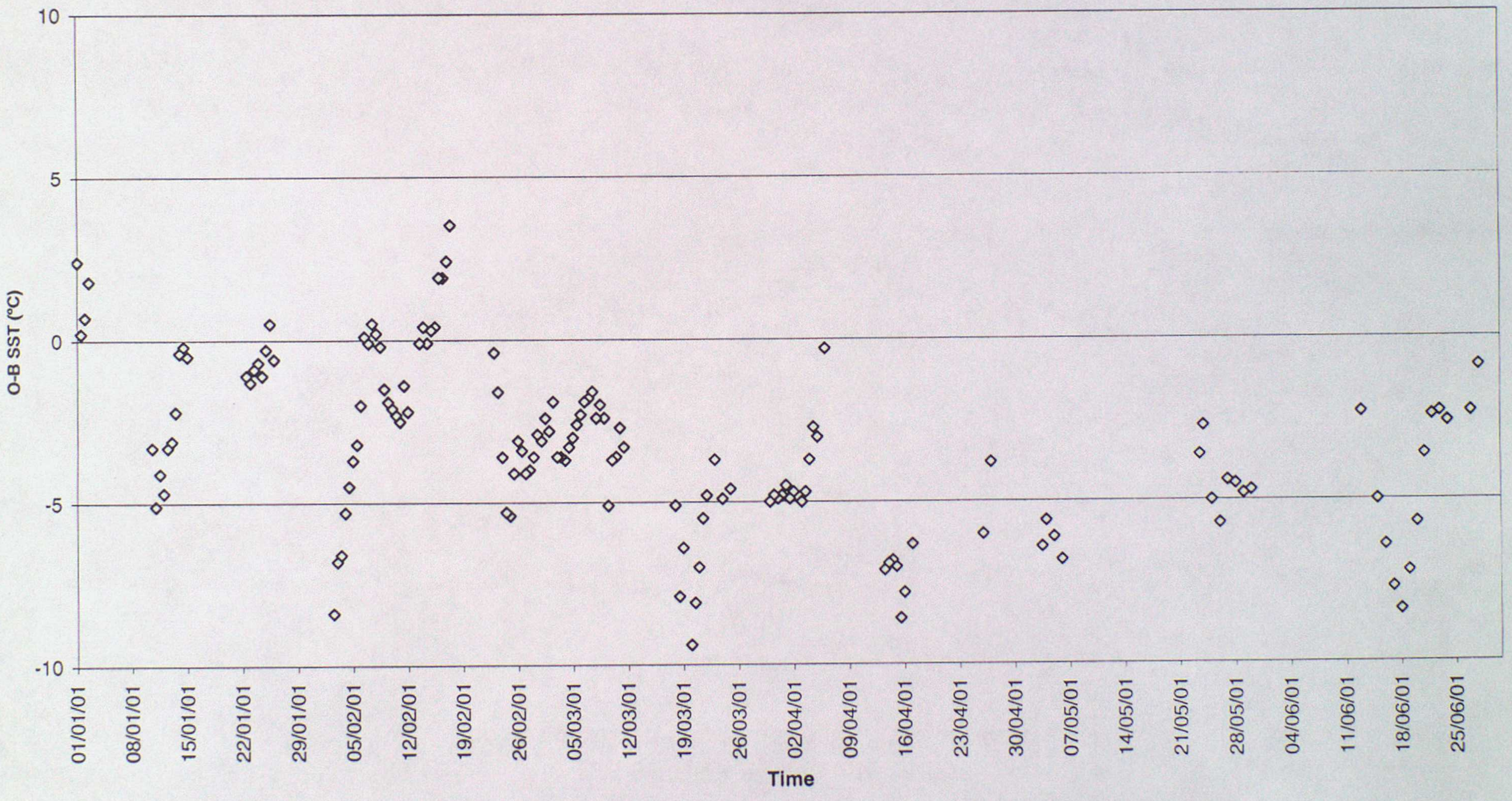
Number of obs. plotted = 47    Number of outliers = 0



O-B SST (°C) for identifier 3ECM7
Number of obs. plotted = 628    Number of outliers = 0

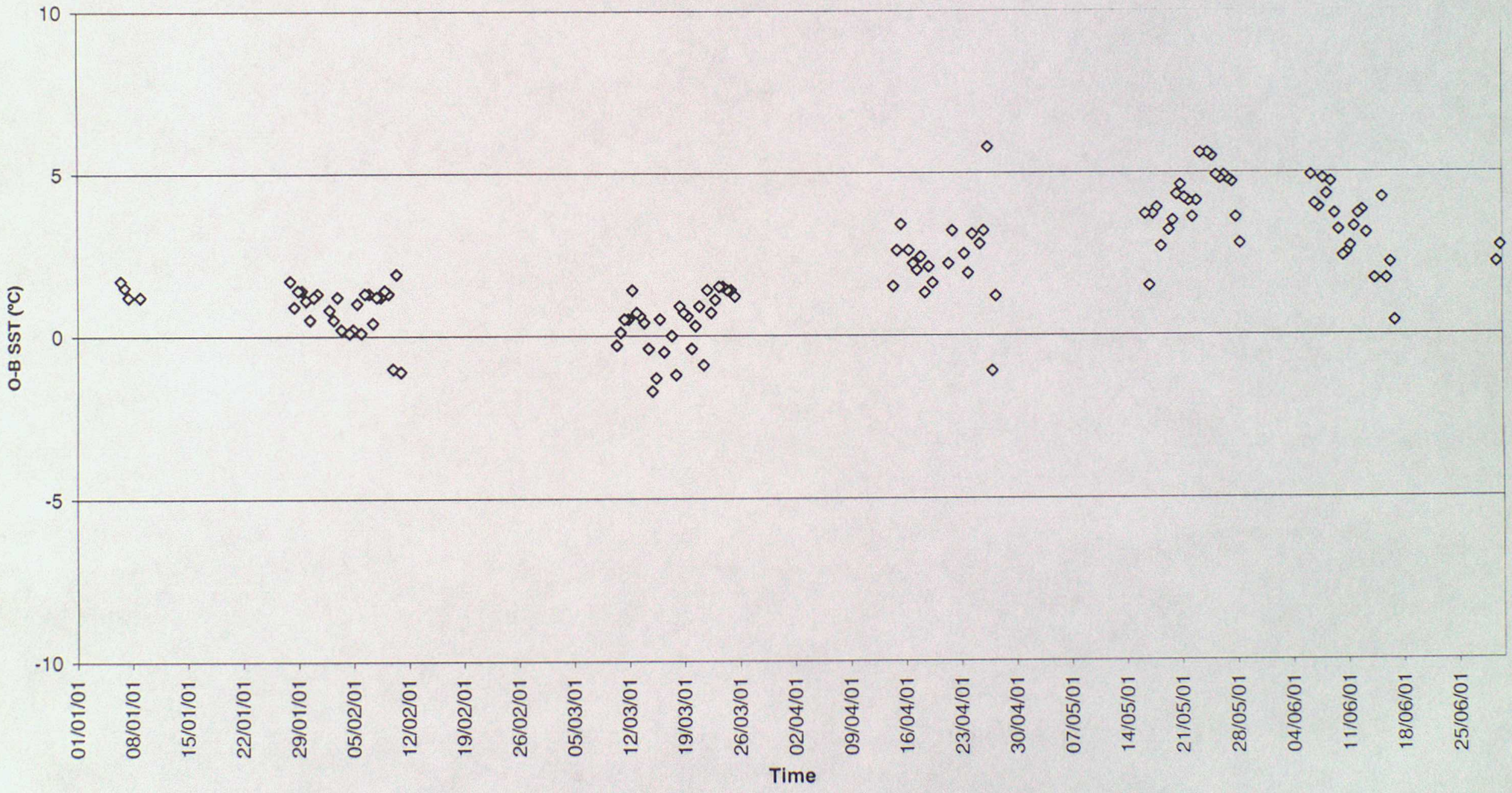


O-B SST (°C) for identifier 3EST7
Number of obs. plotted = 143    Number of outliers = 0

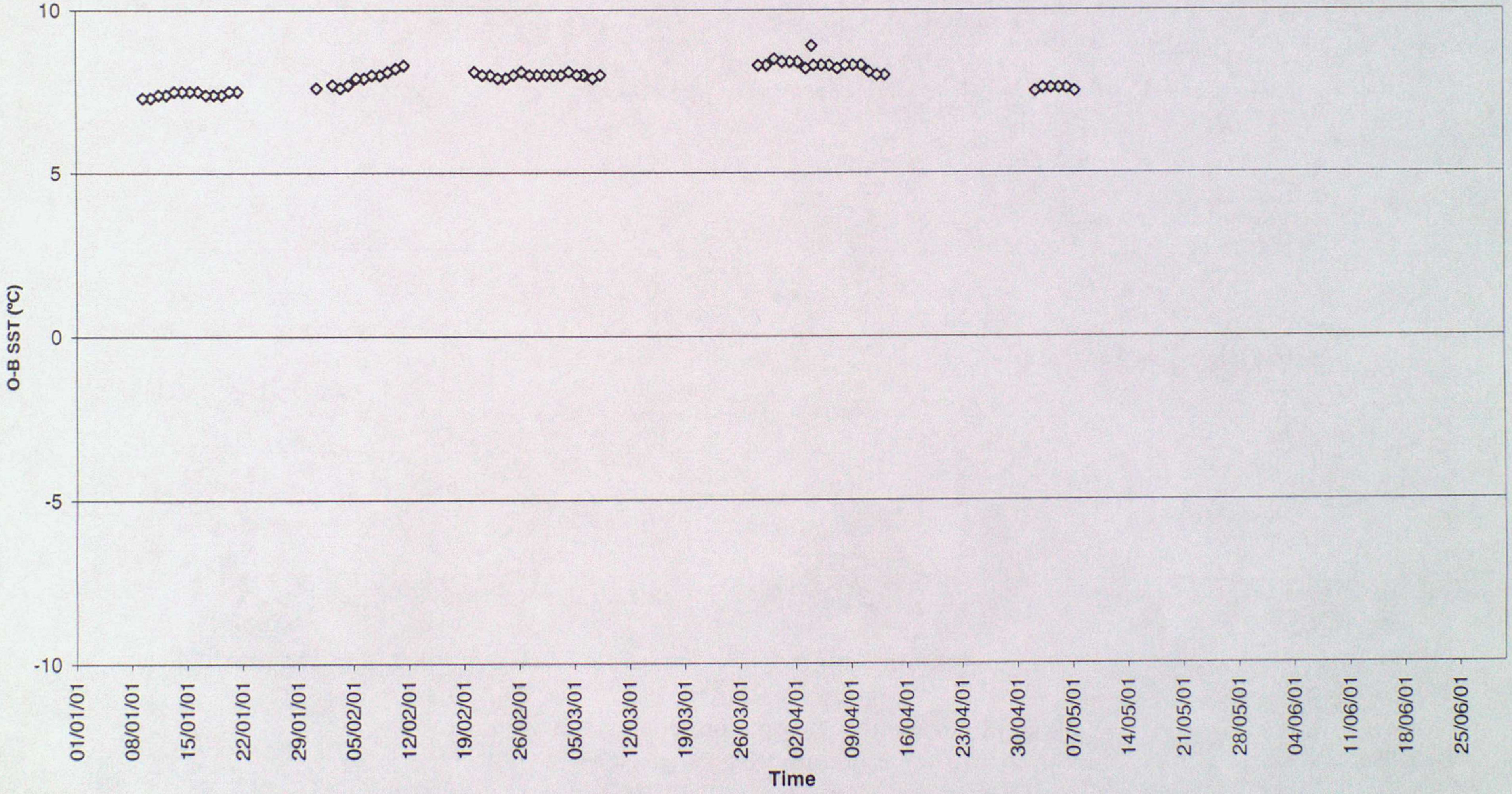


O-B SST (°C) for identifier 3FDV6

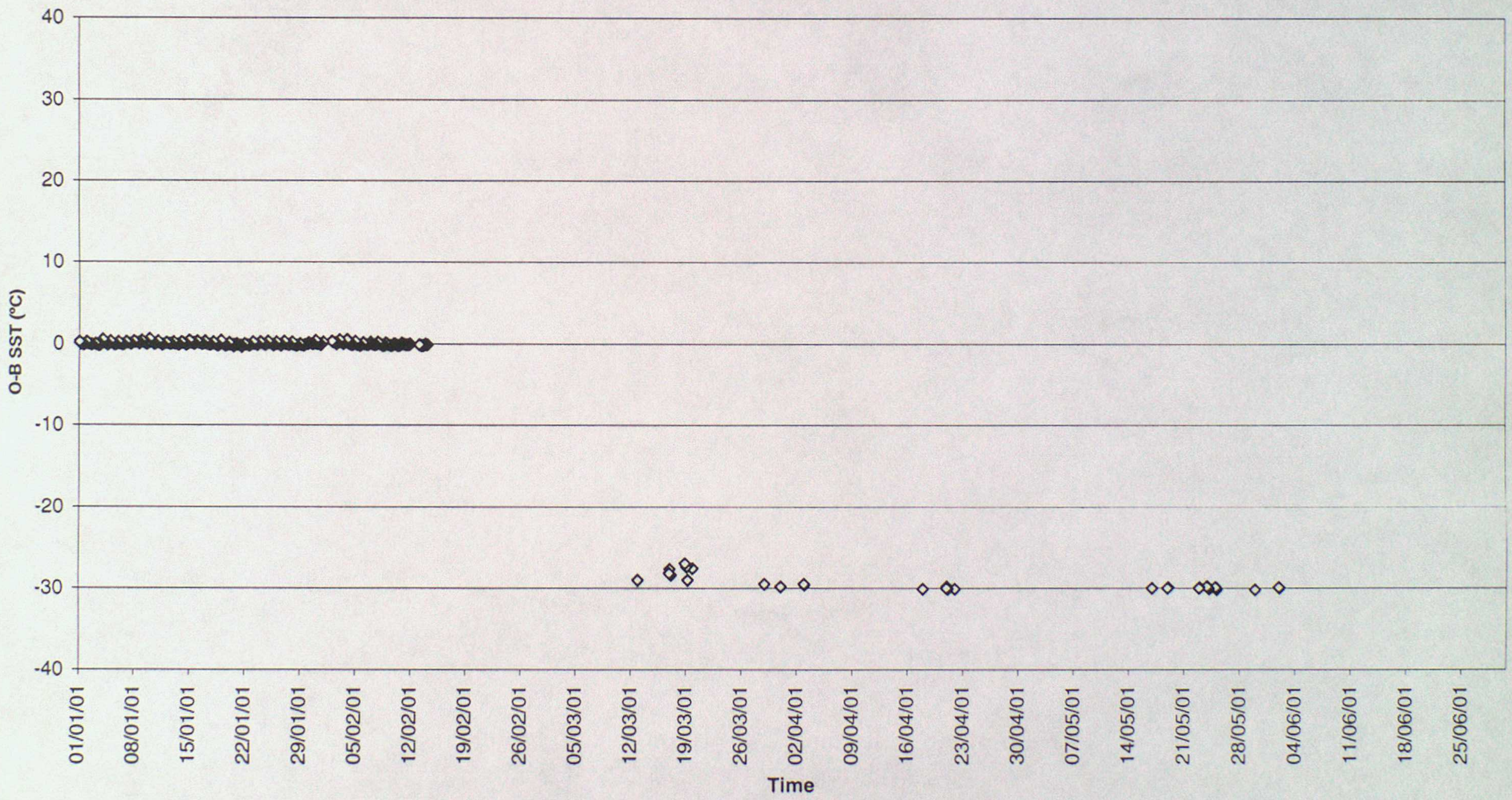
Number of obs. plotted = 125    Number of outliers = 1

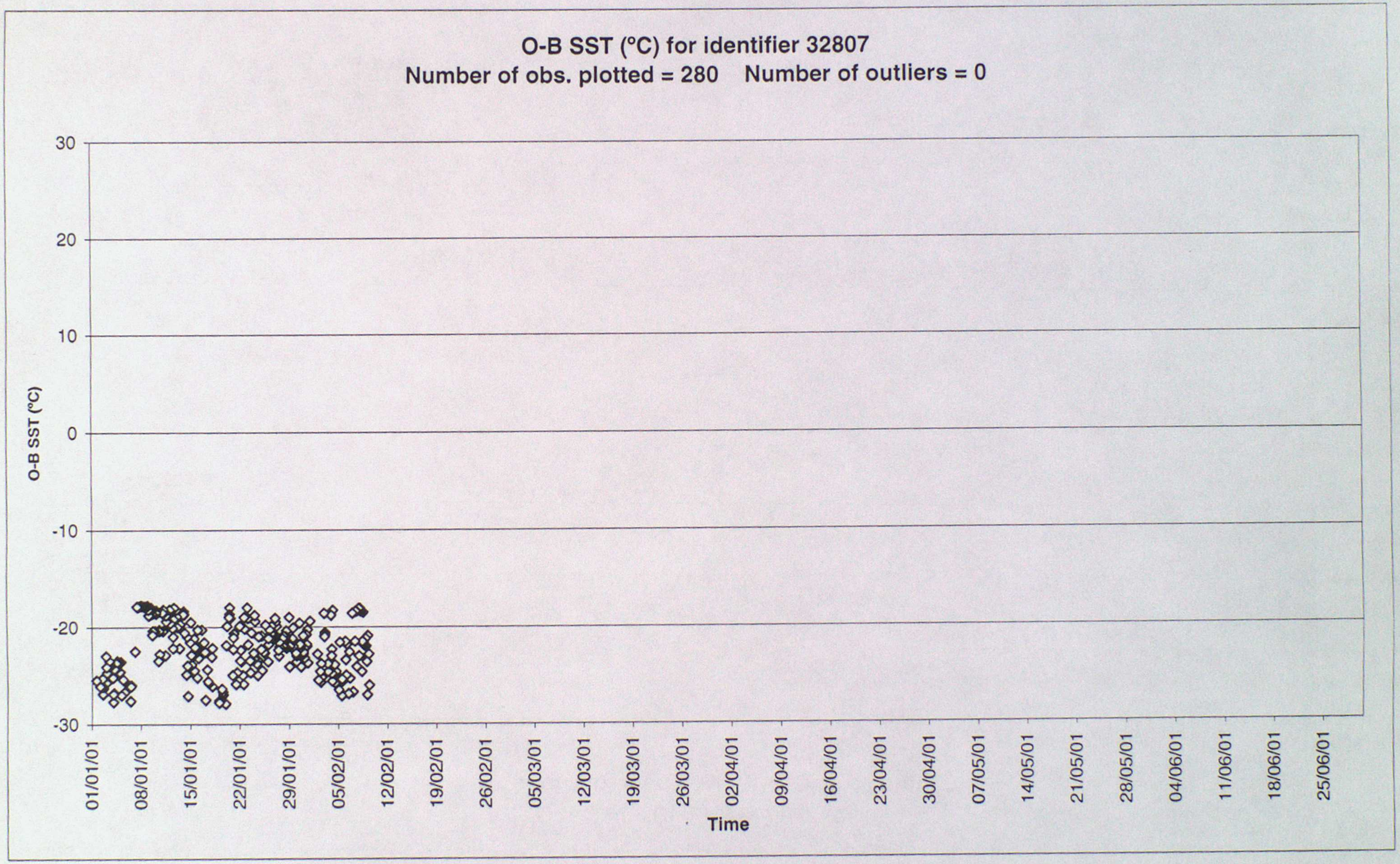


O-B SST (°C) for identifier 3FPA6
Number of obs. plotted = 66    Number of outliers = 0

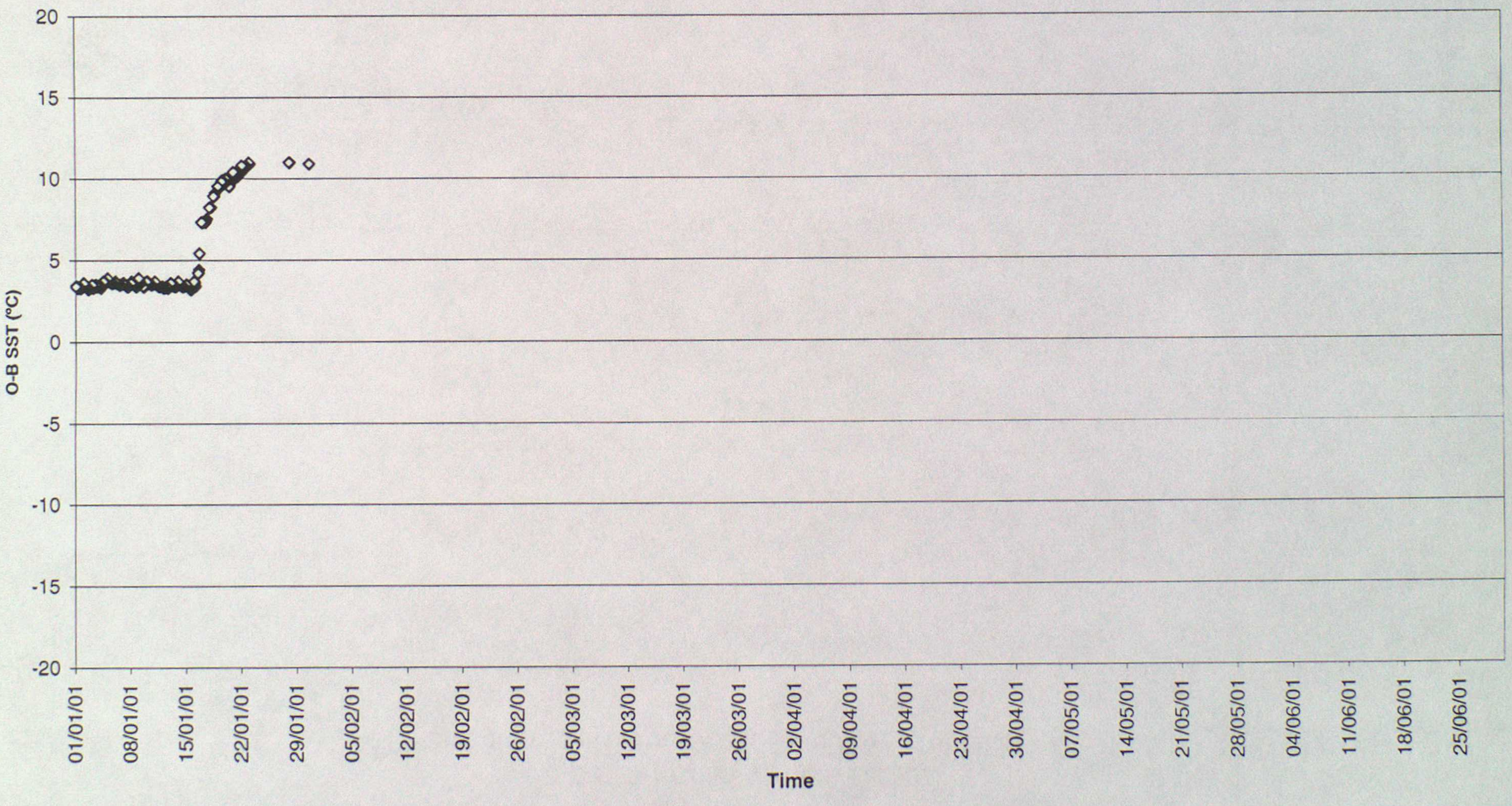


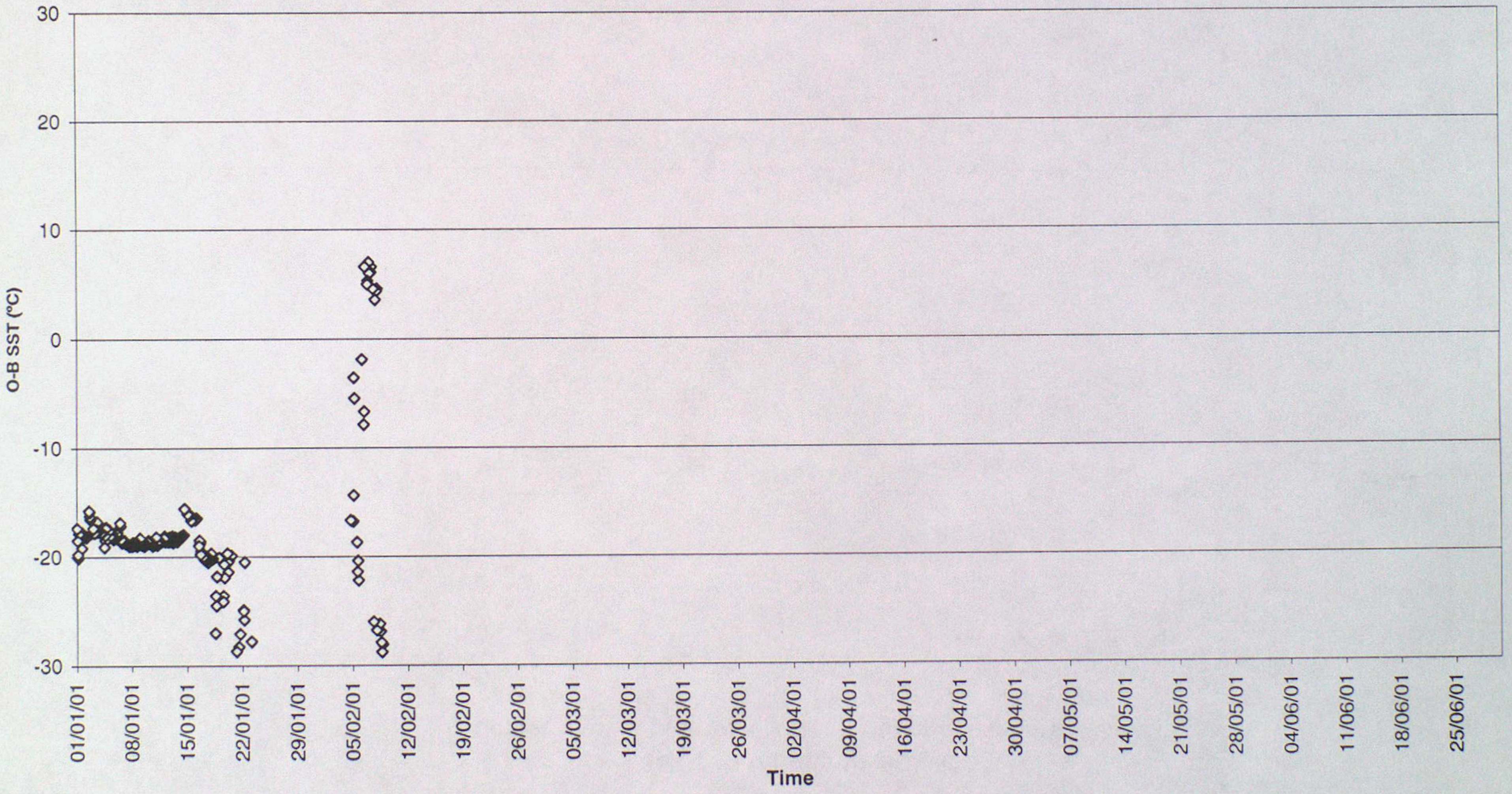
## O-B SST (°C) for identifier 32614
Number of obs. plotted = 352    Number of outliers = 0




O-B SST (°C) for identifier 32807
Number of obs. plotted = 280    Number of outliers = 0
O-B SST (°C)
30
20
10
0
-10
-20
-30
01/01/01
08/01/01
15/01/01
22/01/01
29/01/01
05/02/01
12/02/01
19/02/01
26/02/01
05/03/01
12/03/01
19/03/01
26/03/01
02/04/01
09/04/01
16/04/01
23/04/01
30/04/01
07/05/01
14/05/01
21/05/01
28/05/01
04/06/01
11/06/01
18/06/01
25/06/01
Time

O-B SST (°C) for identifier 32810
Number of obs. plotted = 191    Number of outliers = 0

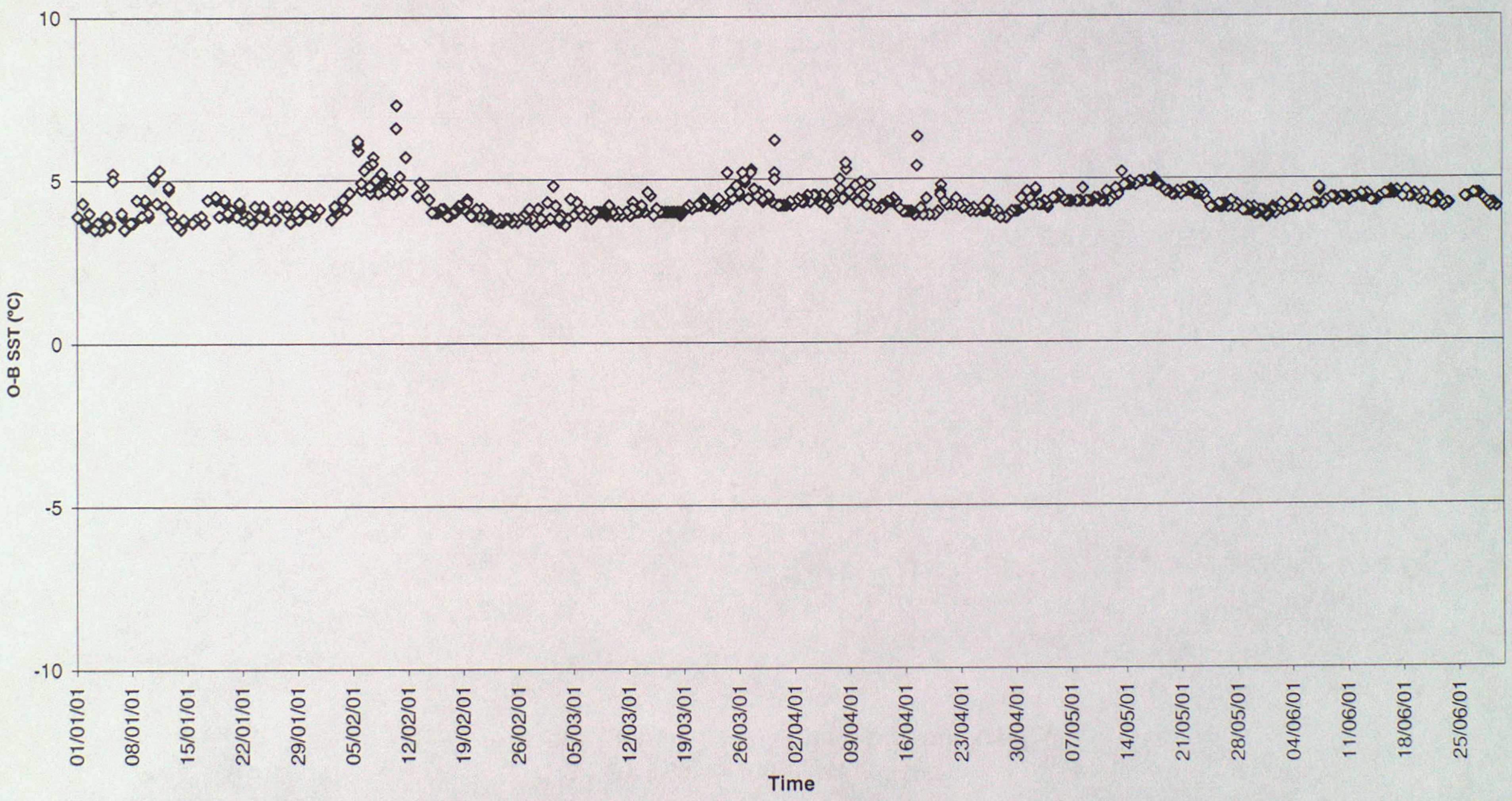


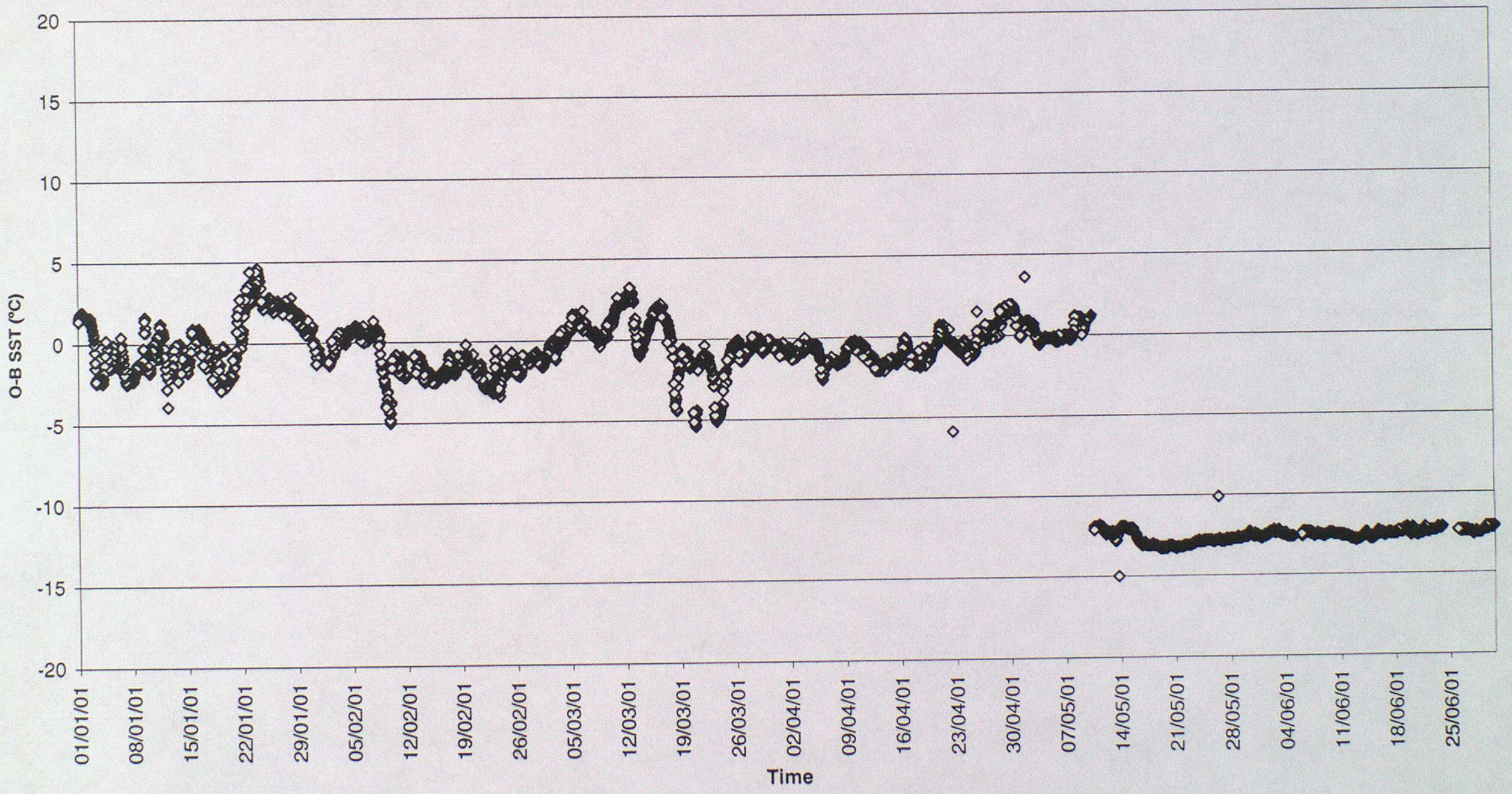


O-B SST (°C) for identifier 32829
Number of obs. plotted = 214    Number of outliers = 0

## O-B SST (°C) for identifier 33502

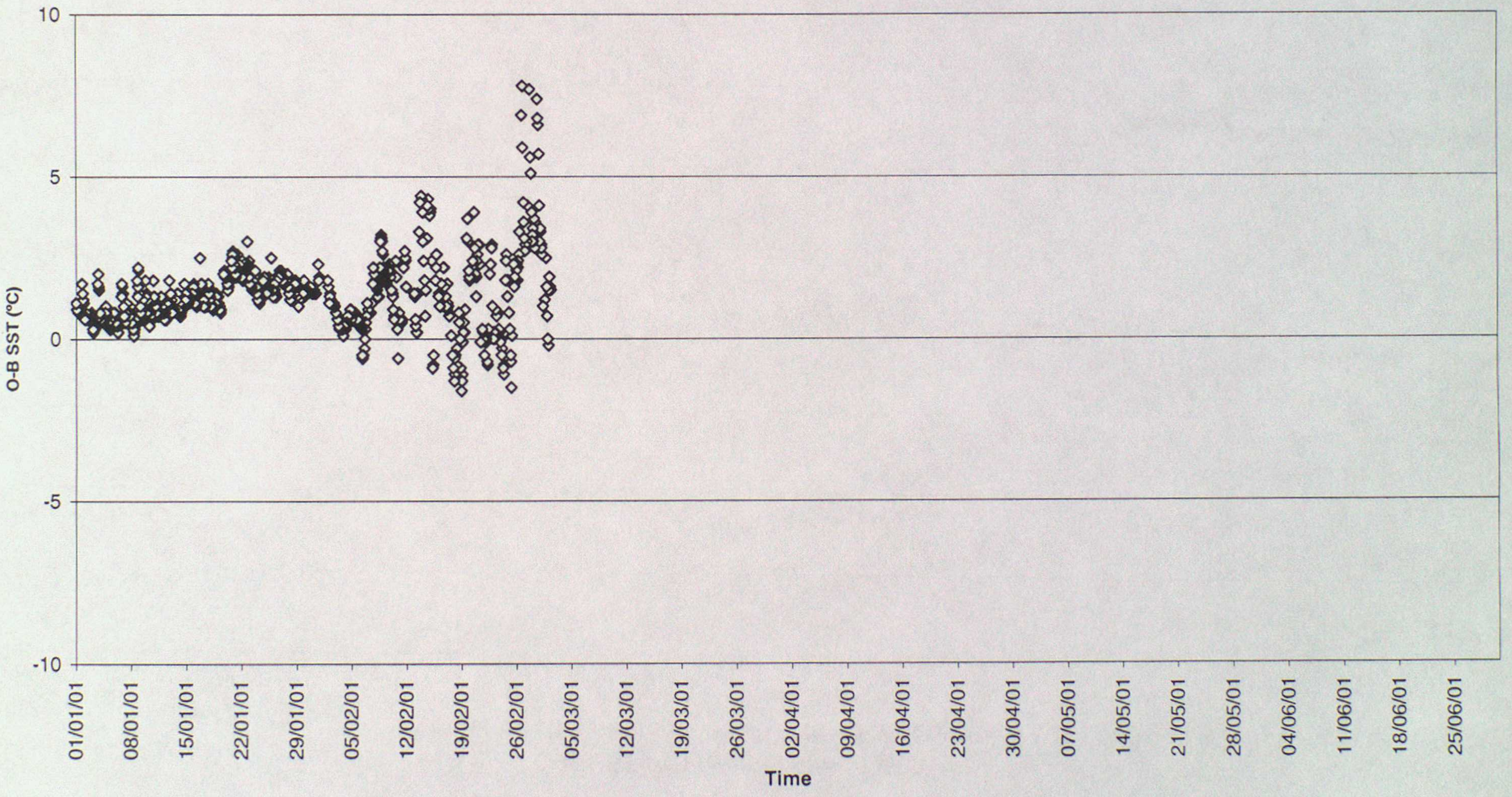
Number of obs. plotted = 609    Number of outliers = 0



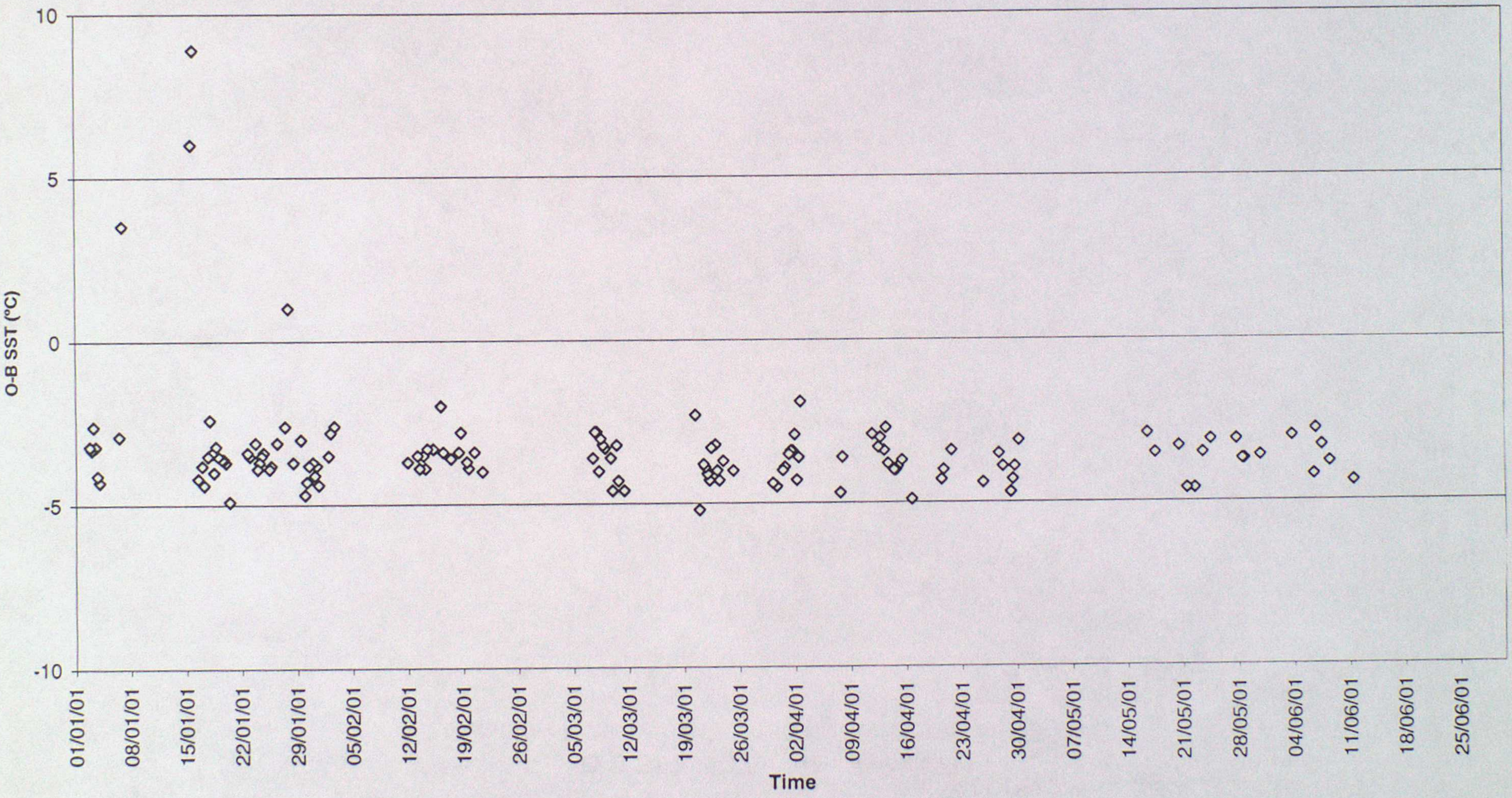


O-B SST (°C) for identifier 33560
Number of obs. plotted = 3642    Number of outliers = 1

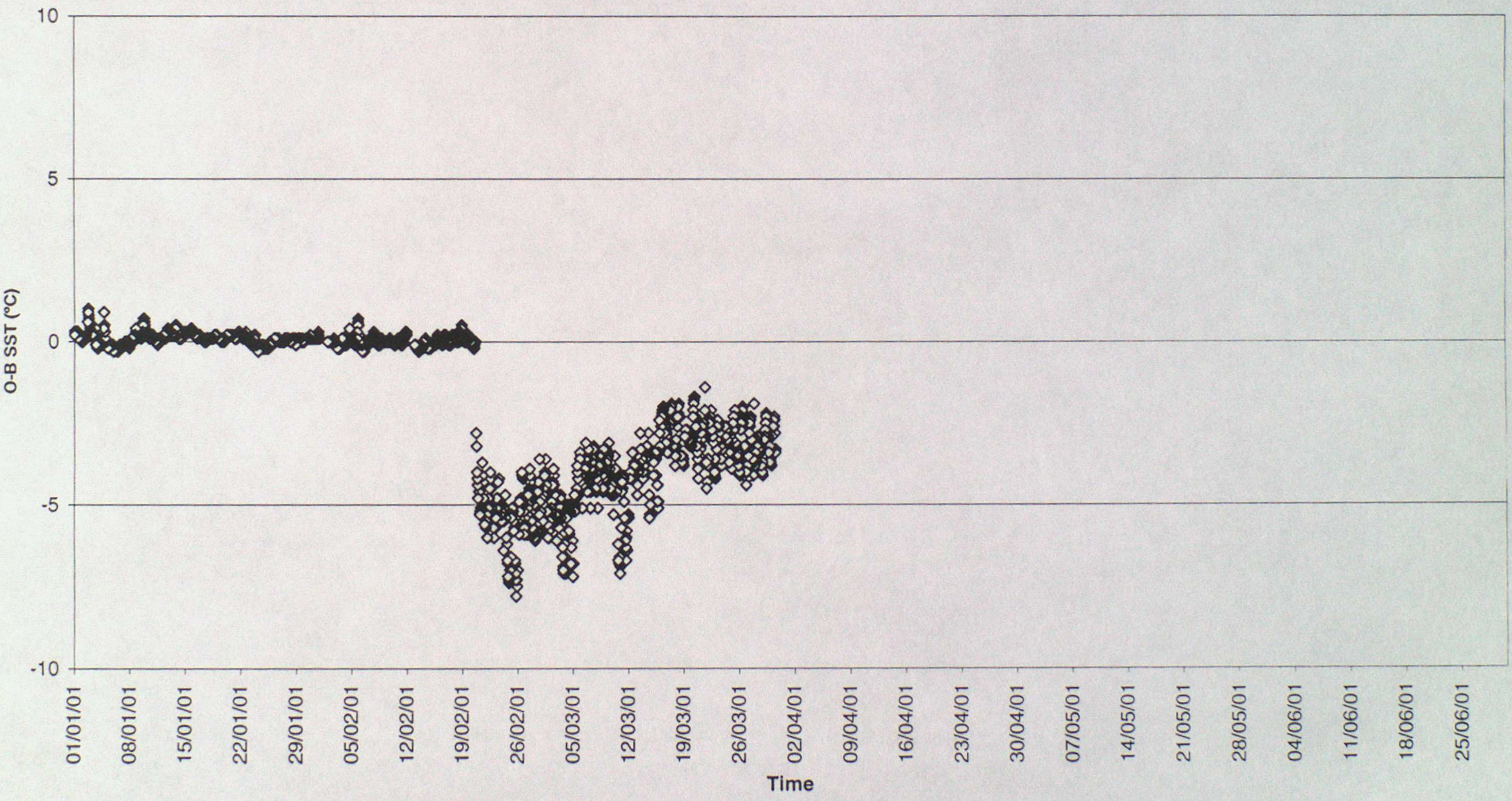
O-B SST (°C) for identifier 33571
Number of obs. plotted = 745    Number of outliers = 0



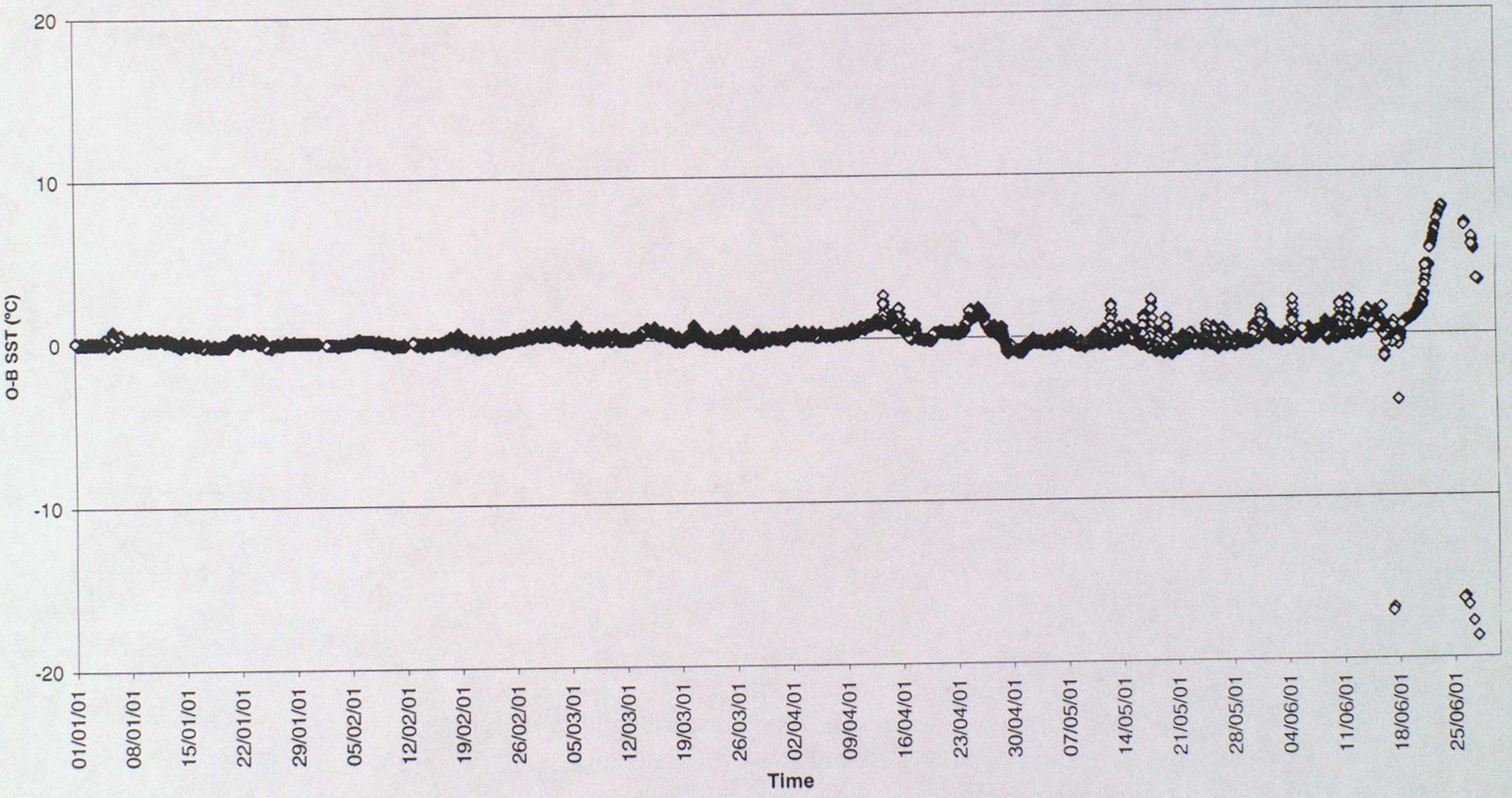
O-B SST (°C) for identifier 413FMM6
Number of obs. plotted = 138    Number of outliers = 2

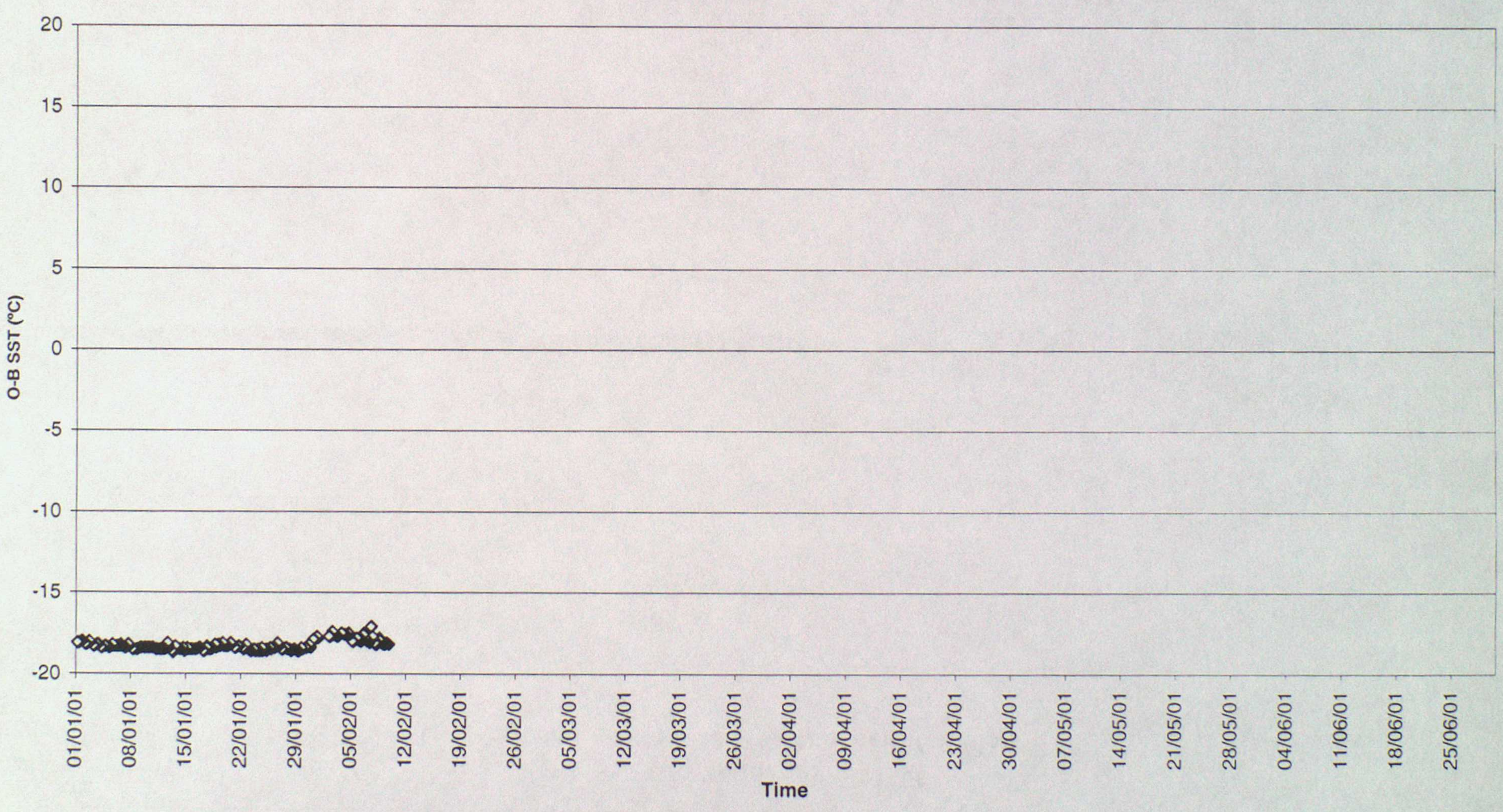


O-B SST (°C) for identifier 41594
Number of obs. plotted = 1583    Number of outliers = 0

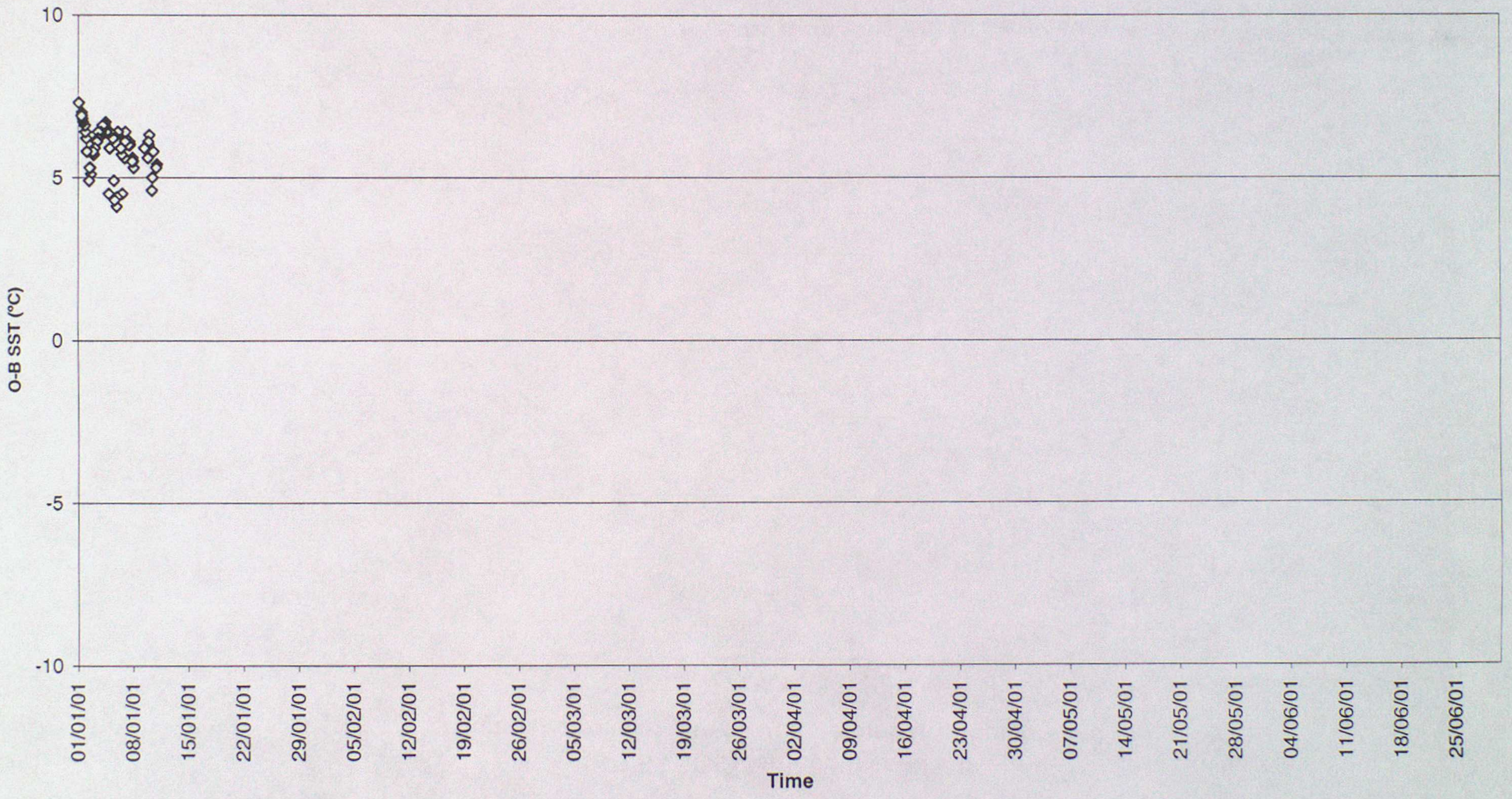


O-B SST (°C) for identifier 41595
Number of obs. plotted = 3581    Number of outliers = 0



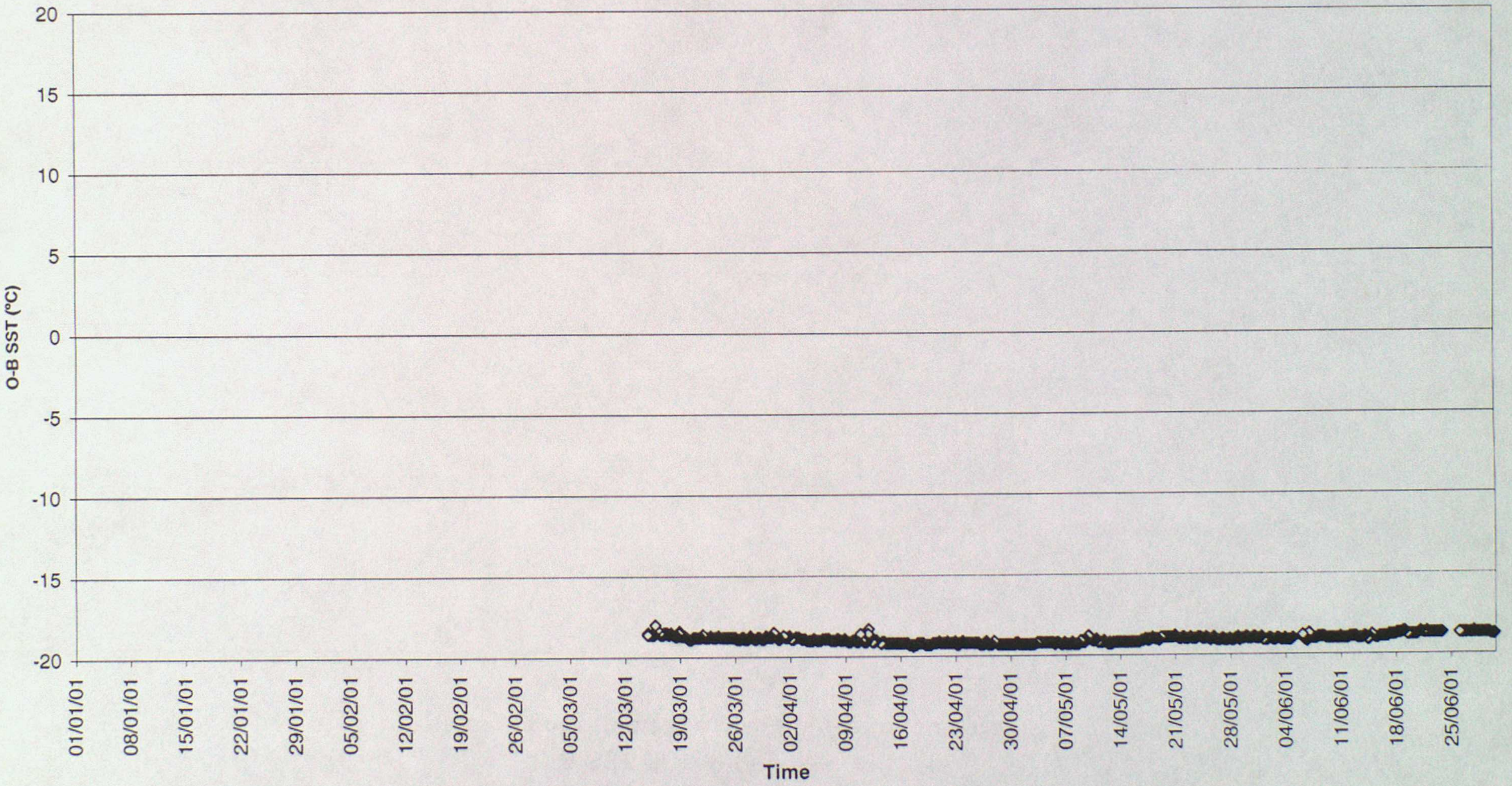


O-B SST (°C) for identifier 41619
Number of obs. plotted = 323    Number of outliers = 0

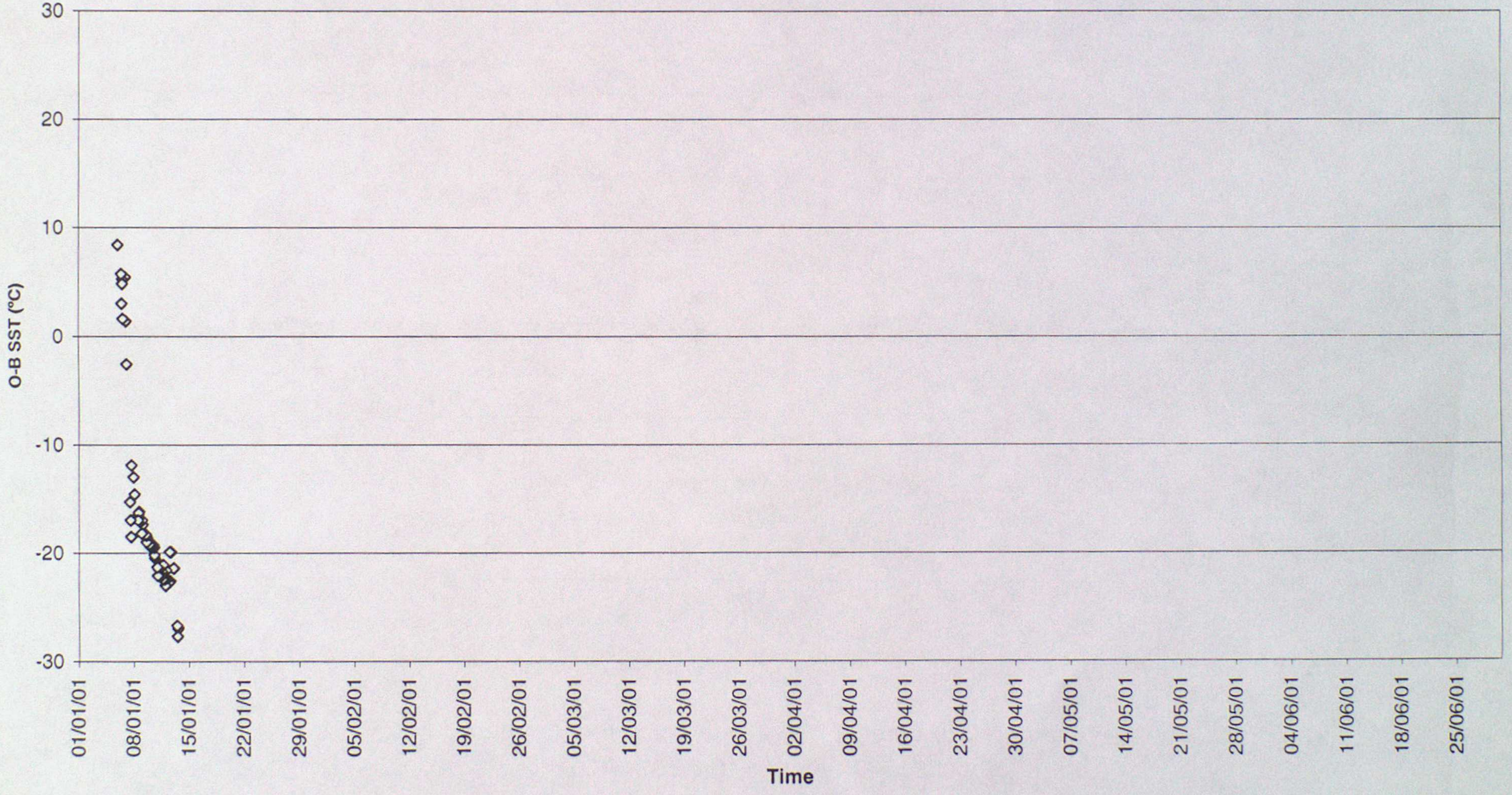


O-B SST (°C) for identifier 41940
Number of obs. plotted = 77    Number of outliers = 0

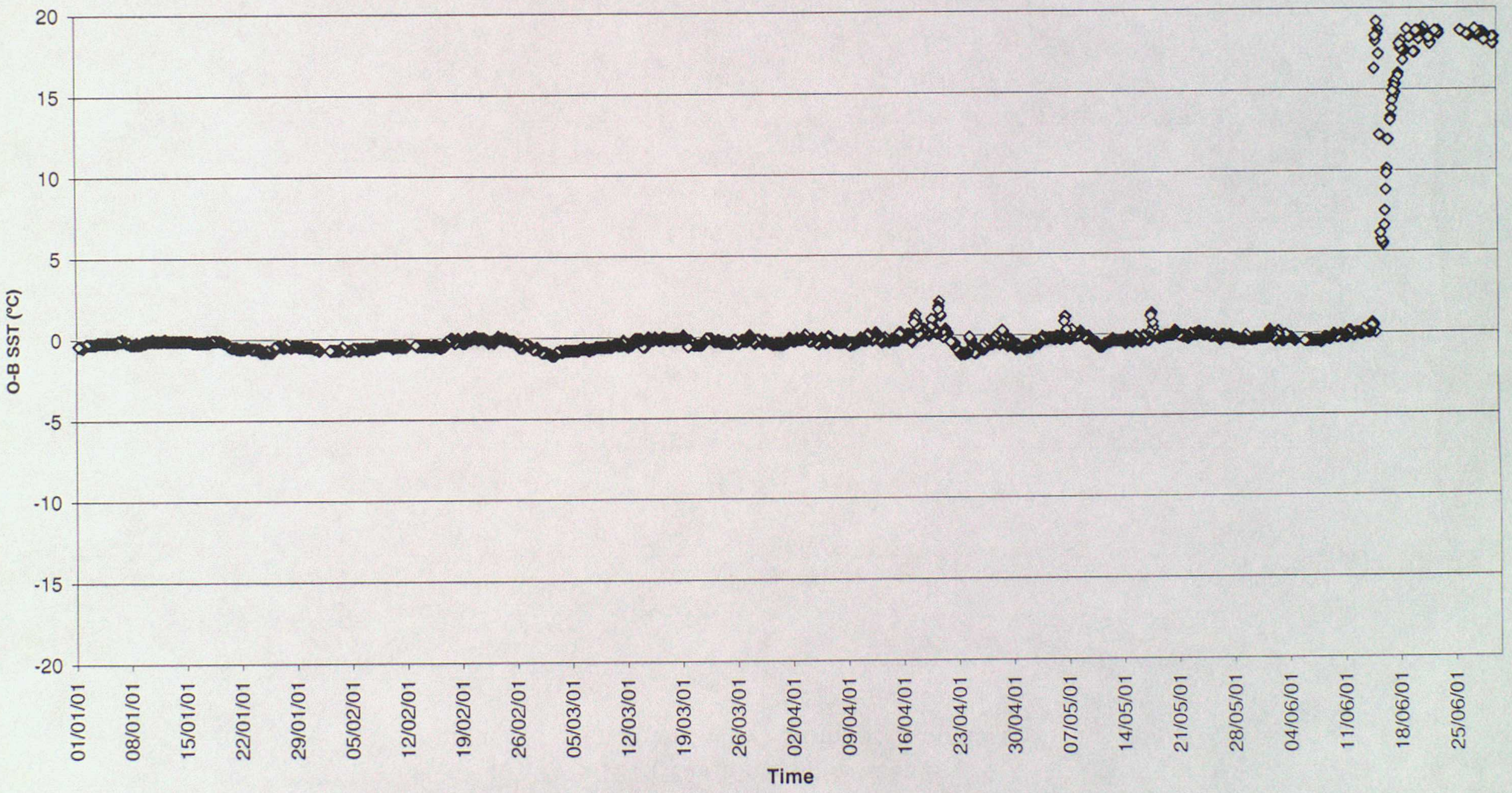
O-B SST (°C) for identifier 43508
Number of obs. plotted = 768    Number of outliers = 0



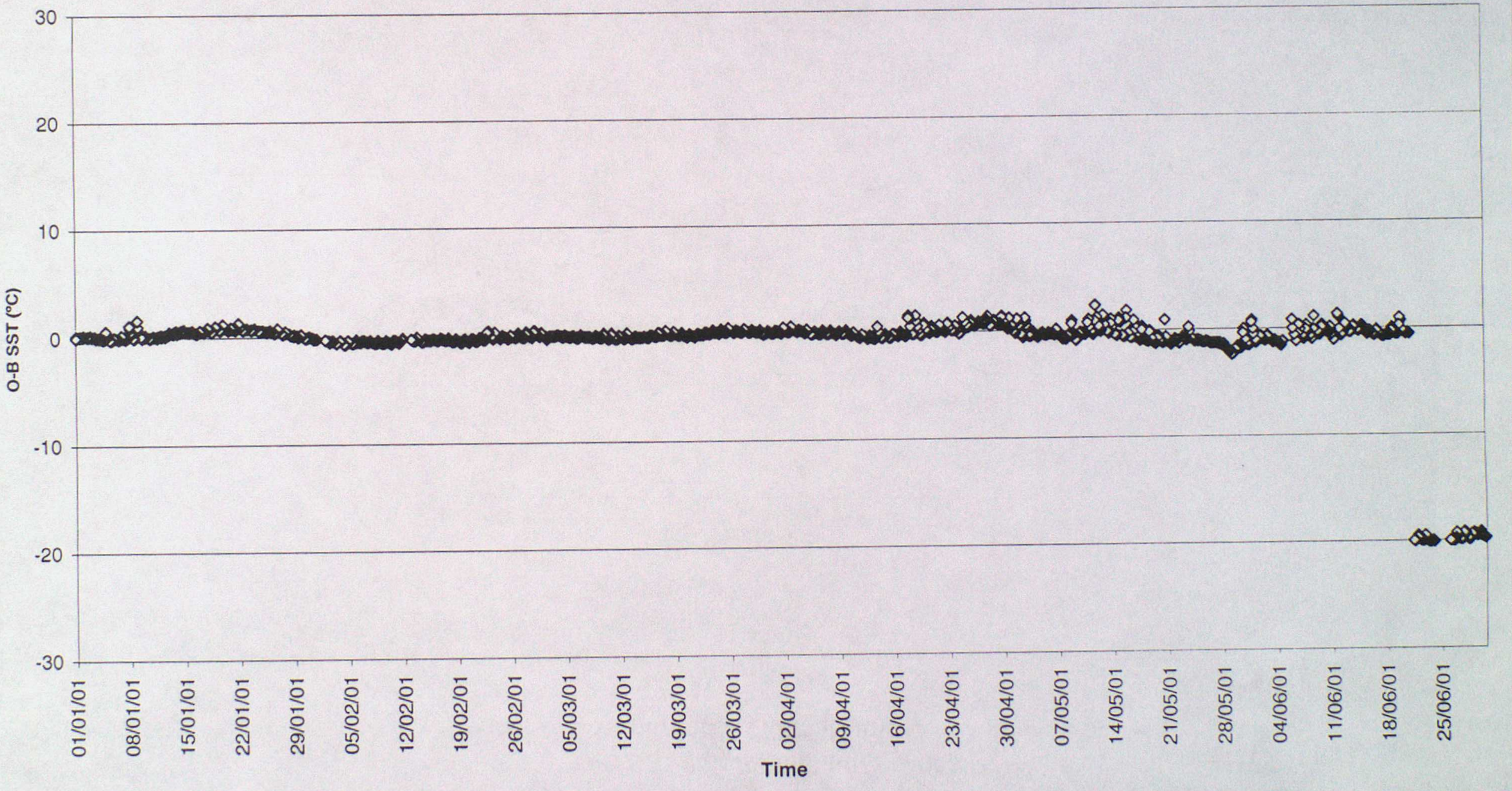
O-B SST (°C) for identifier 43532
Number of obs. plotted = 55    Number of outliers = 0

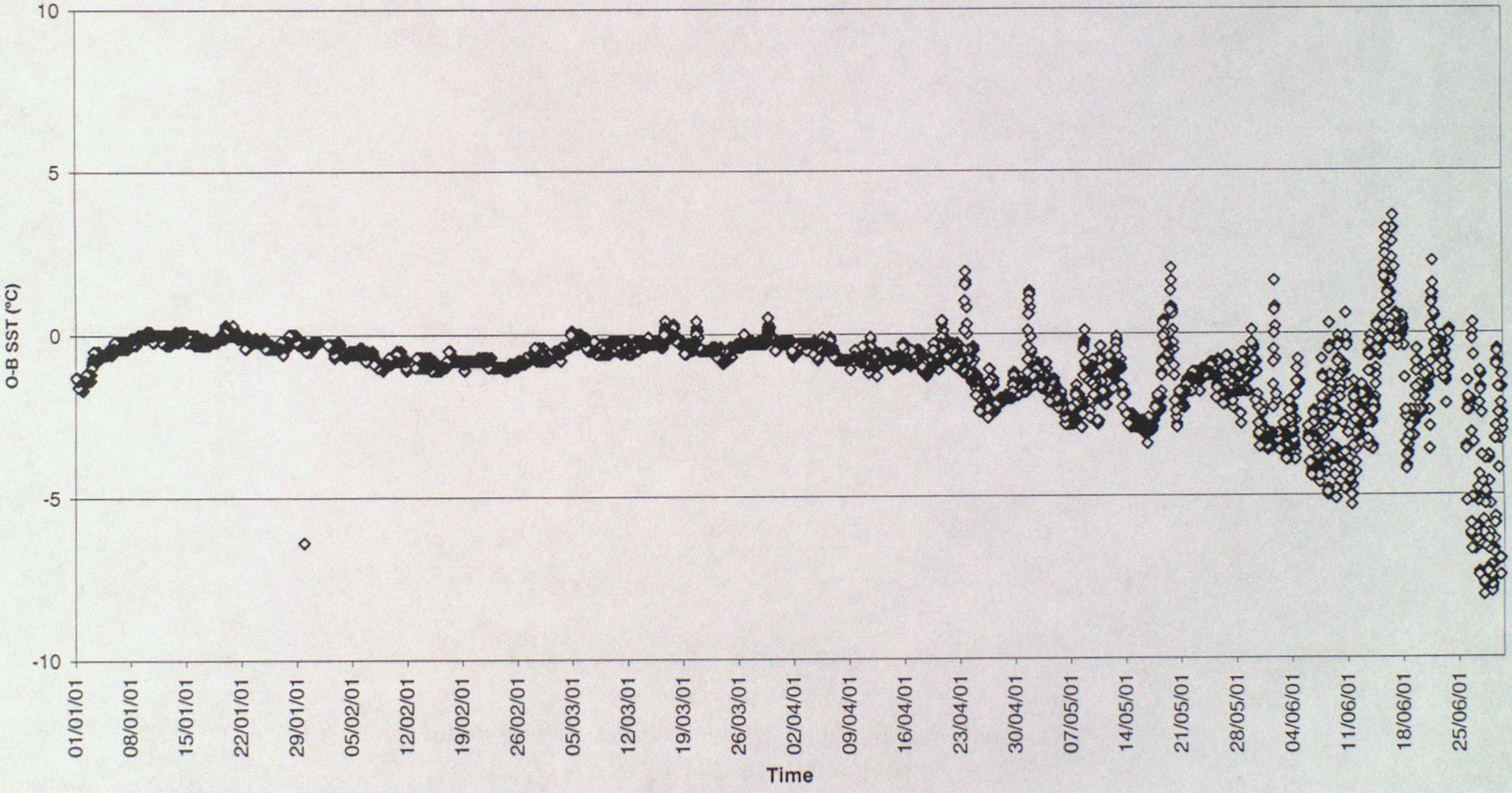


O-B SST (°C) for identifier 43904
Number of obs. plotted = 1649    Number of outliers = 0

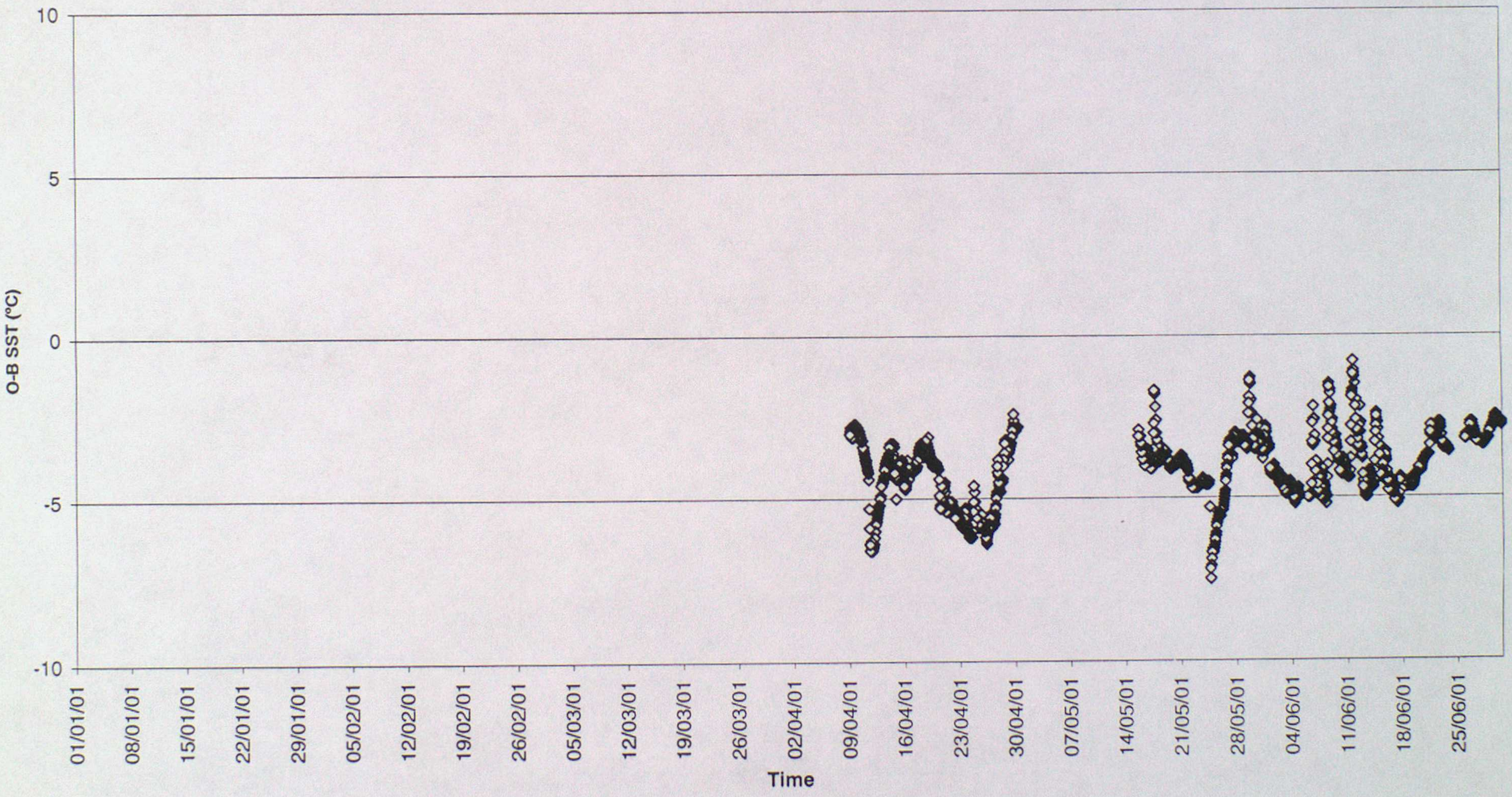


O-B SST (°C) for identifier 43912
Number of obs. plotted = 1322    Number of outliers = 0



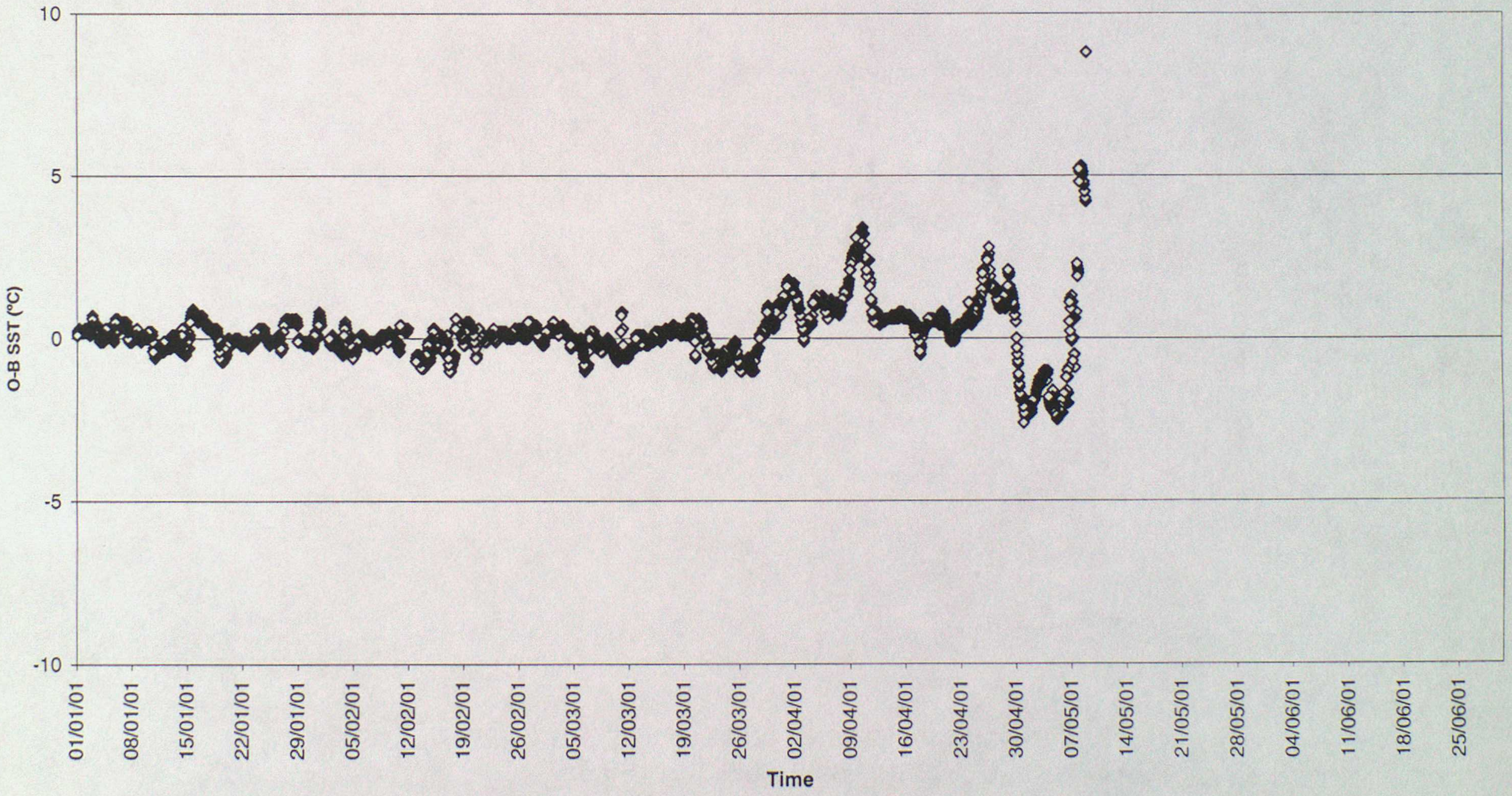


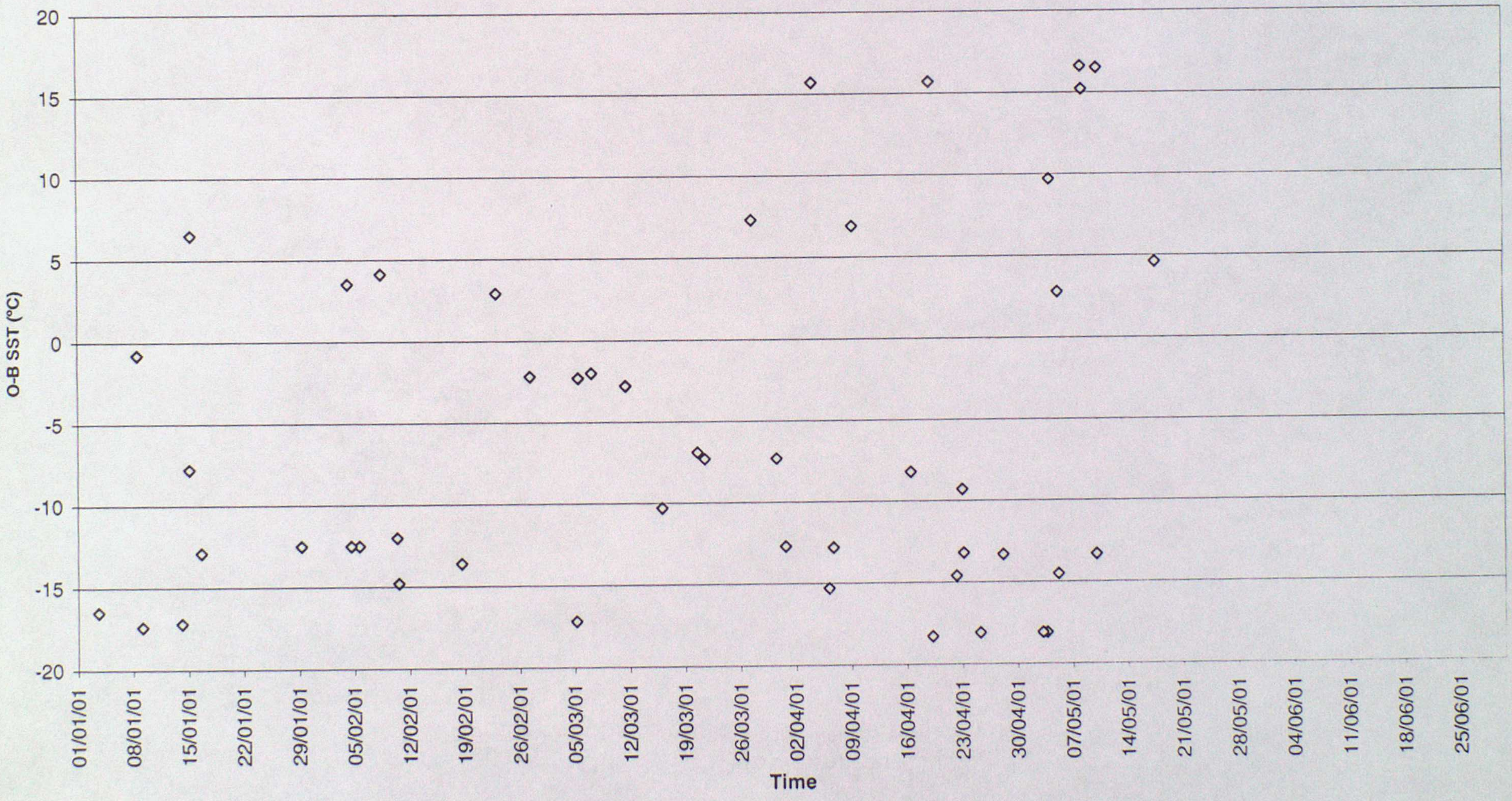
O-B SST (°C) for identifier 44008
Number of obs. plotted = 4172    Number of outliers = 0



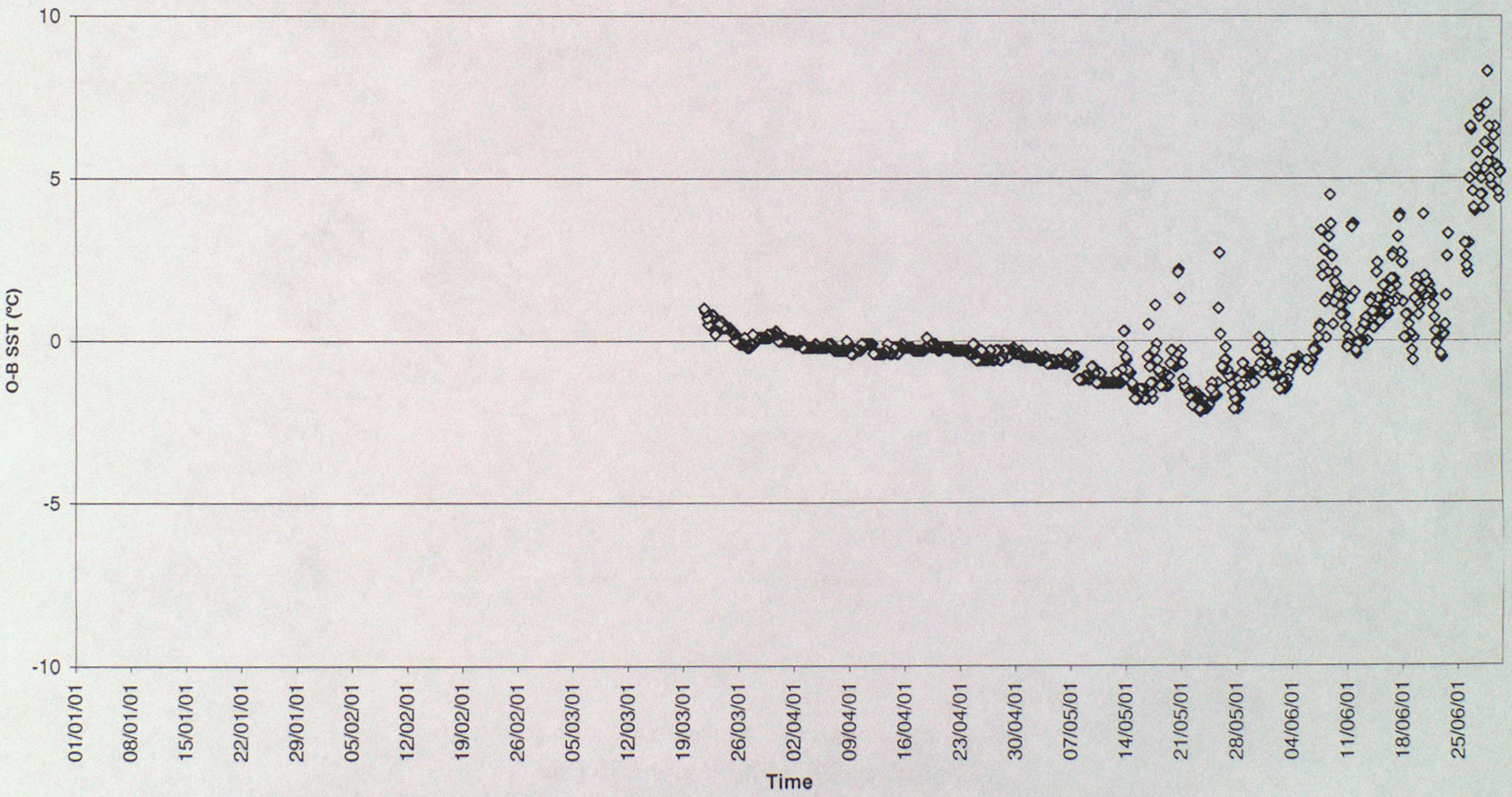
O-B SST (ºC) for identifier 44624
Number of obs. plotted = 1972    Number of outliers = 0

O-B SST (°C) for identifier 44741
Number of obs. plotted = 2825    Number of outliers = 1

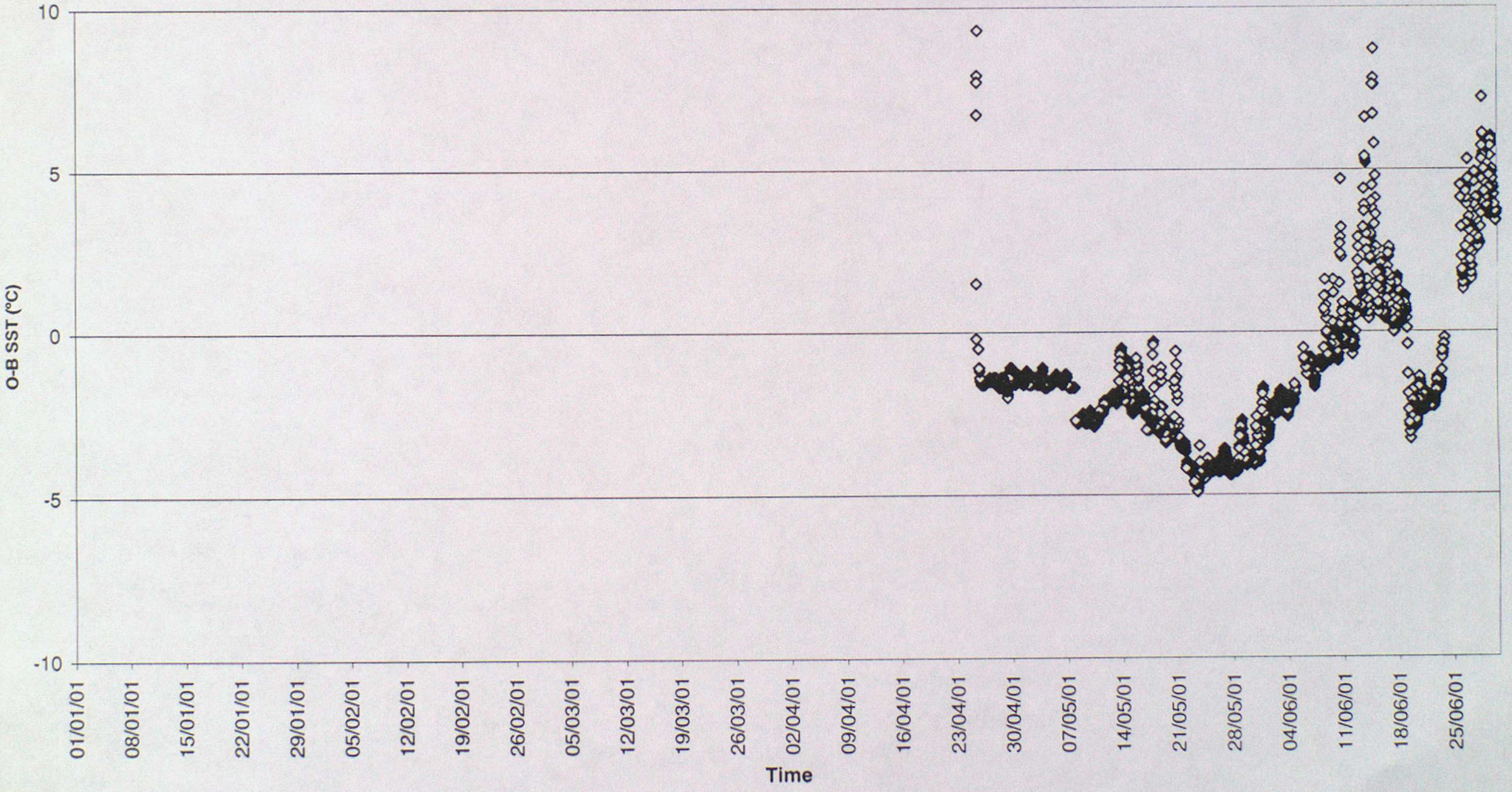


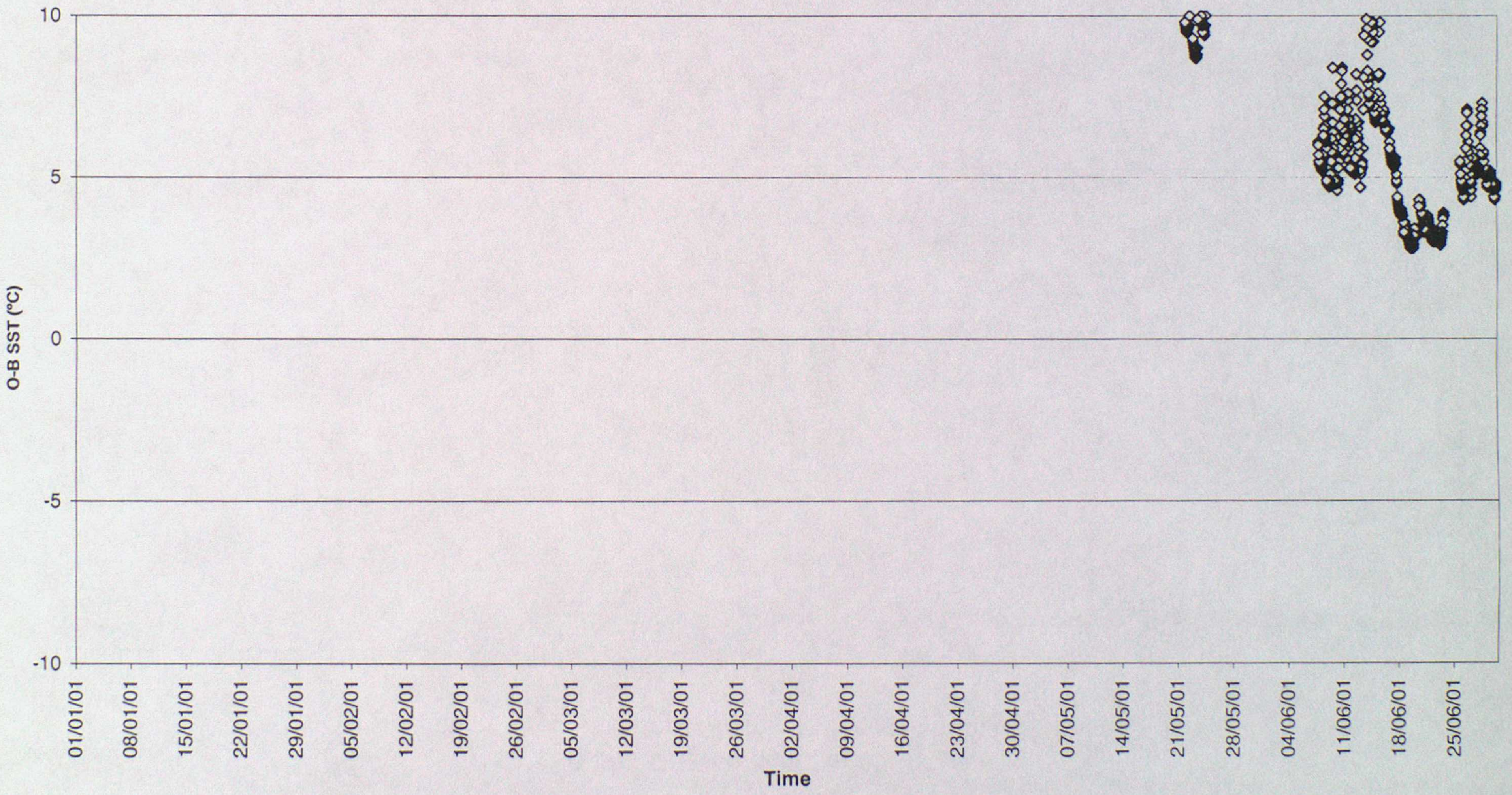

O-B SST (°C) for identifier 44772
Number of obs. plotted = 52    Number of outliers = 1

O-B SST (°C) for identifier 45007
Number of obs. plotted = 782    Number of outliers = 0

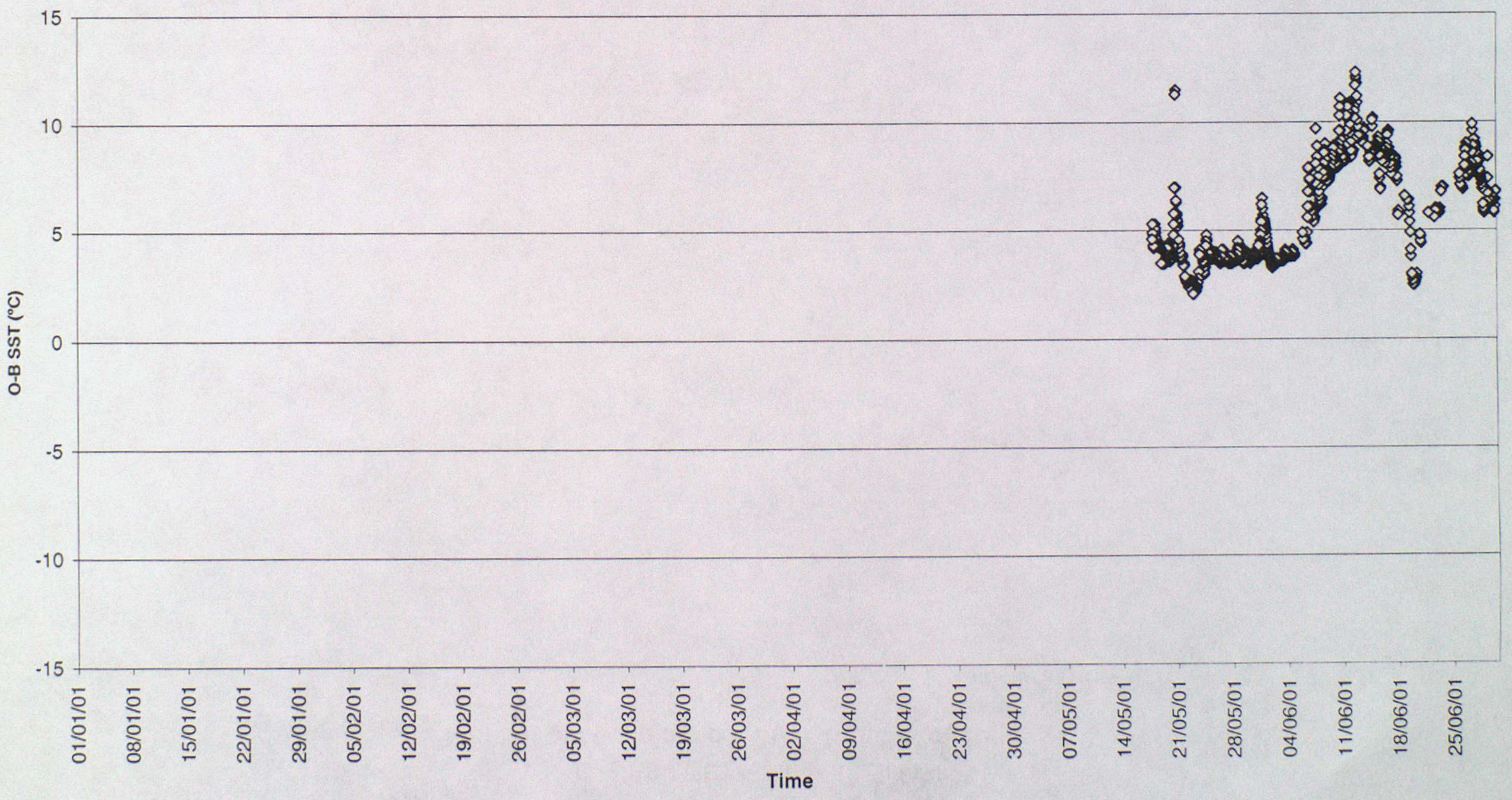


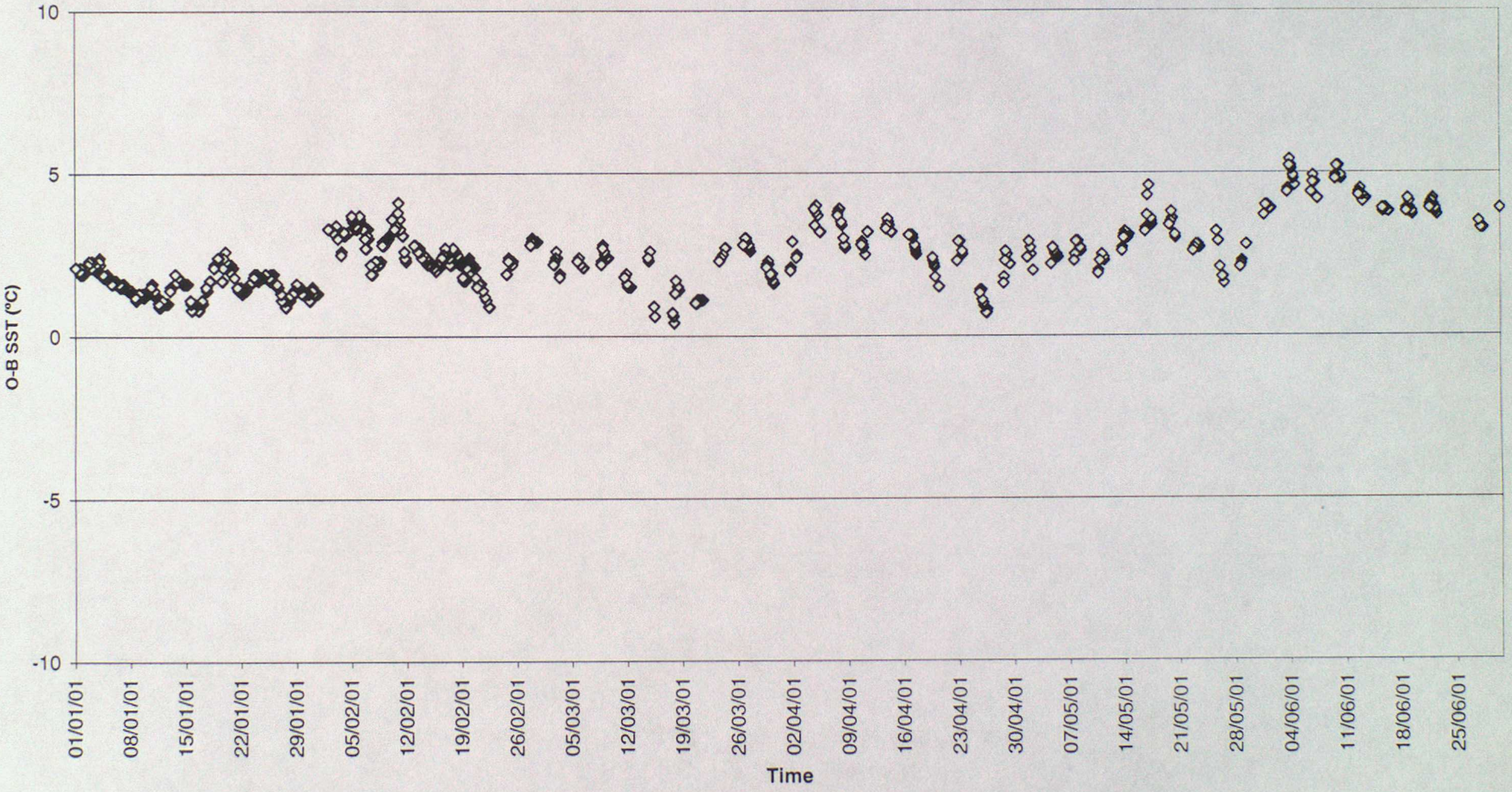
O-B SST (°C) for identifier 45149
Number of obs. plotted = 1515    Number of outliers = 0




O-B SST (°C) for identifier 45151
Number of obs. plotted = 533    Number of outliers = 133

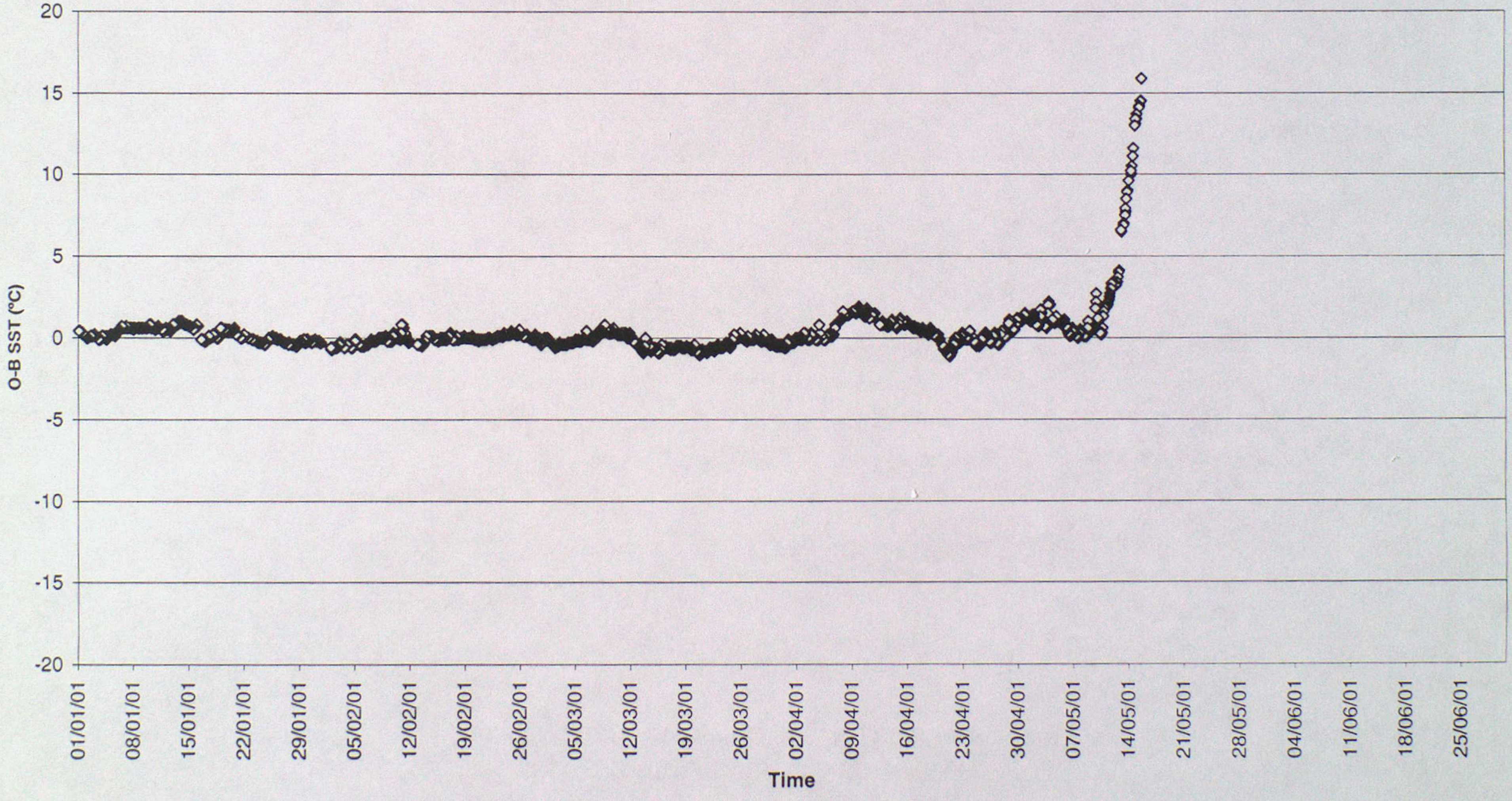
O-B SST (°C) for identifier 45154
Number of obs. plotted = 841    Number of outliers = 0



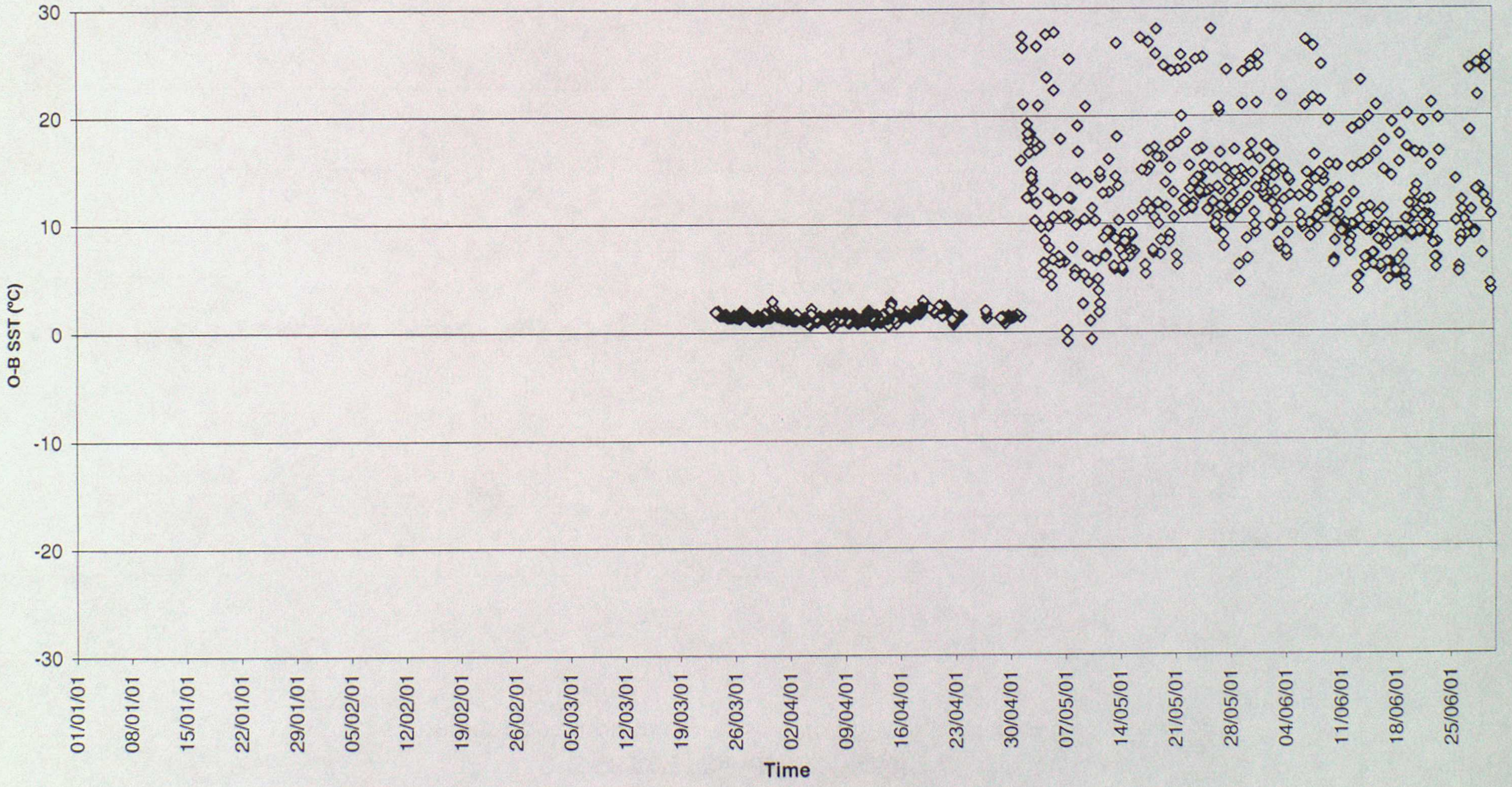


O-B SST (°C) for identifier 46736
Number of obs. plotted = 714    Number of outliers = 0

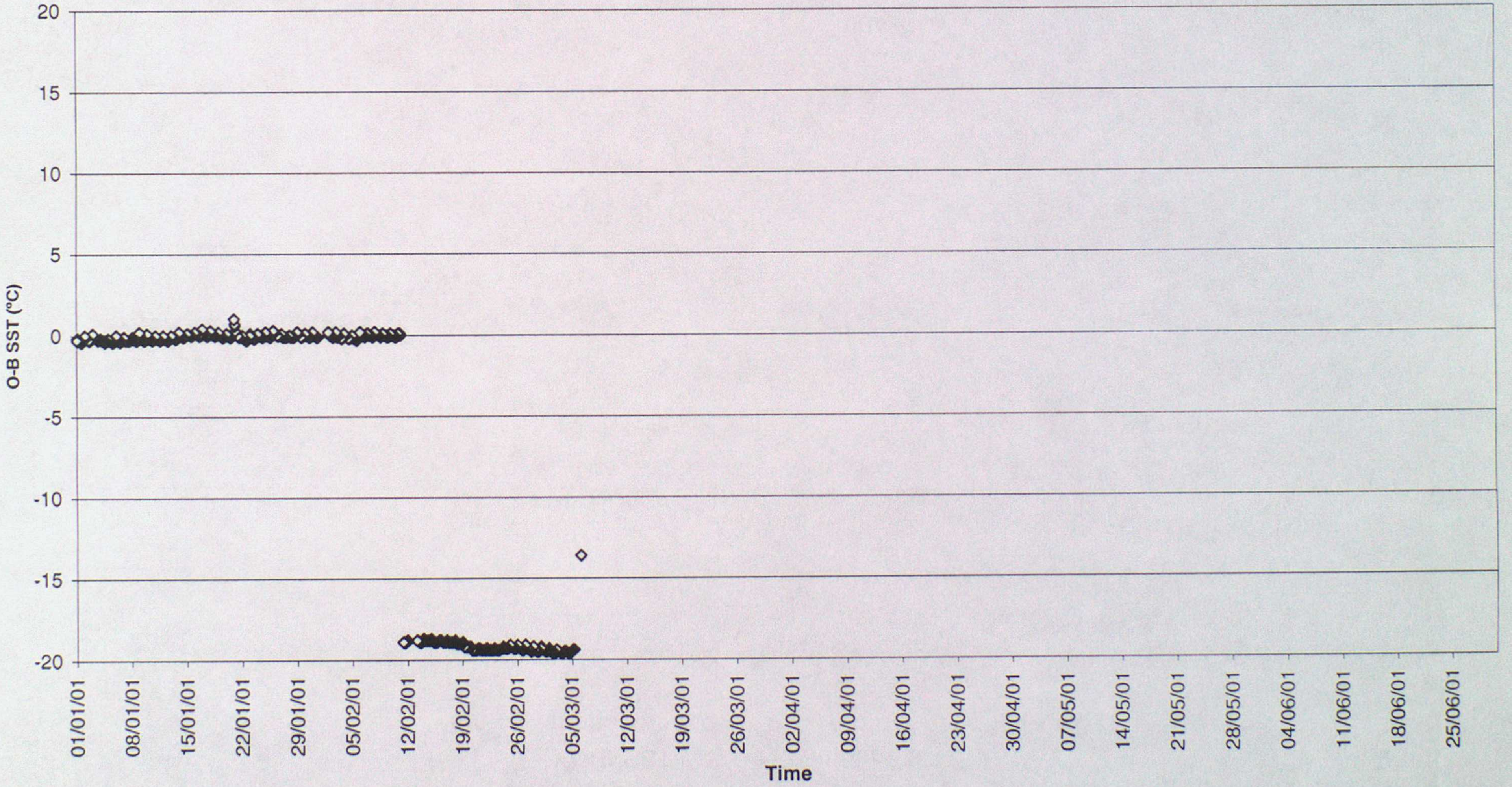
O-B SST (°C) for identifier 46927
Number of obs. plotted = 1469    Number of outliers = 0

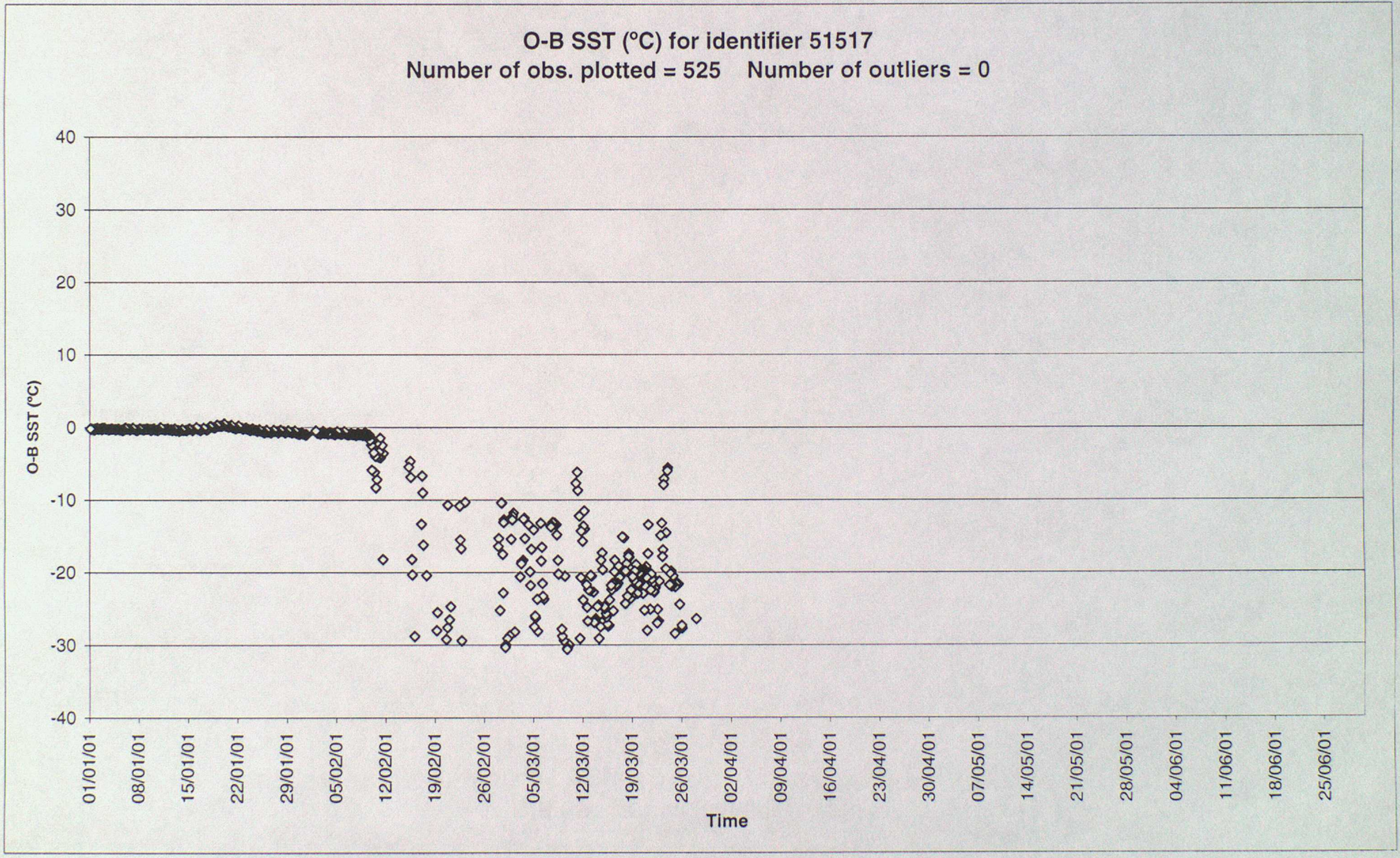


O-B SST (°C) for identifier 46969
Number of obs. plotted = 816    Number of outliers = 0



O-B SST (°C) for identifier 51516
Number of obs. plotted = 514    Number of outliers = 0

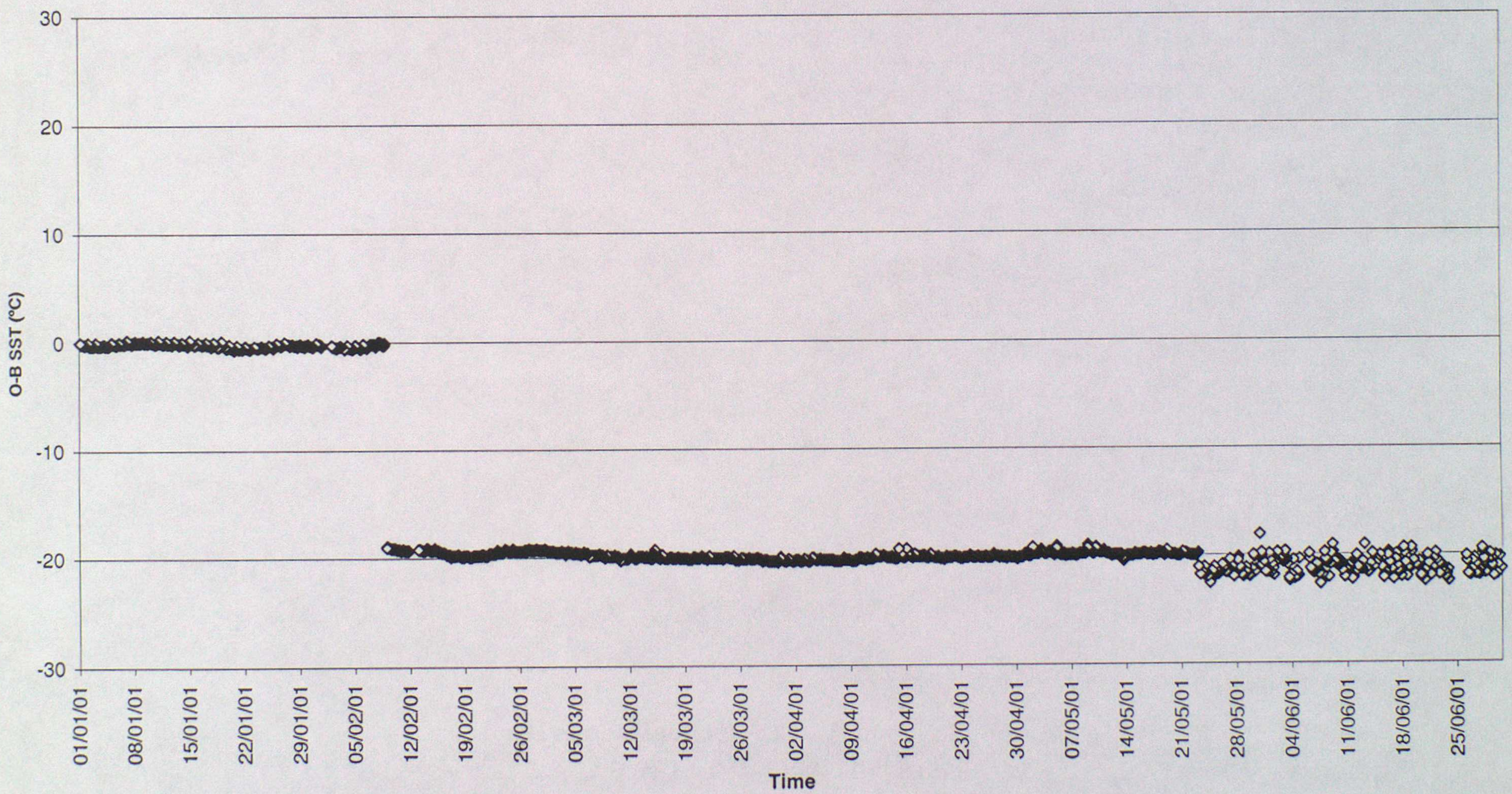


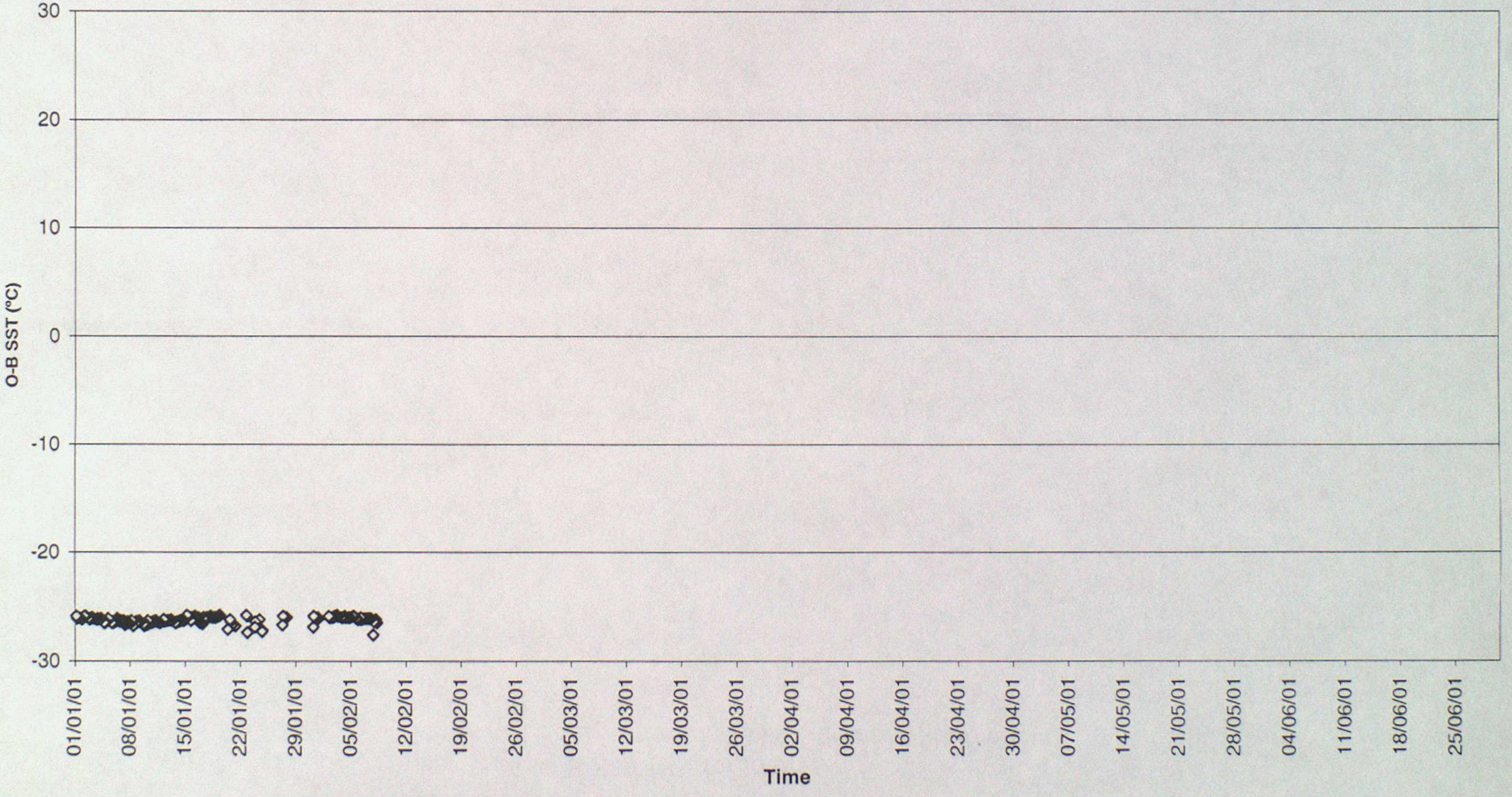


O-B SST (°C) for identifier 51517

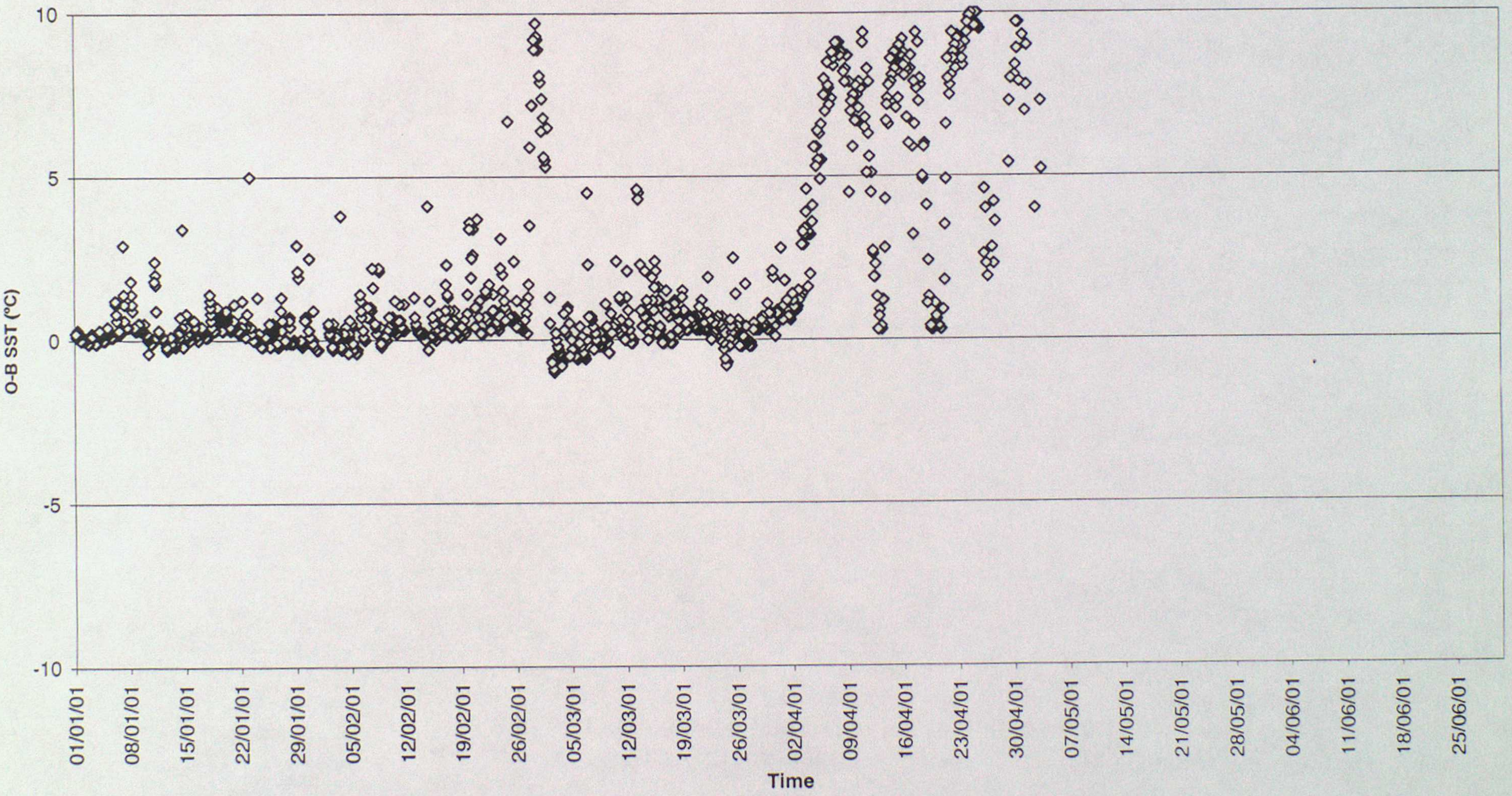
Number of obs. plotted = 525    Number of outliers = 0

O-B SST (°C) for identifier 51527
Number of obs. plotted = 1368    Number of outliers = 0

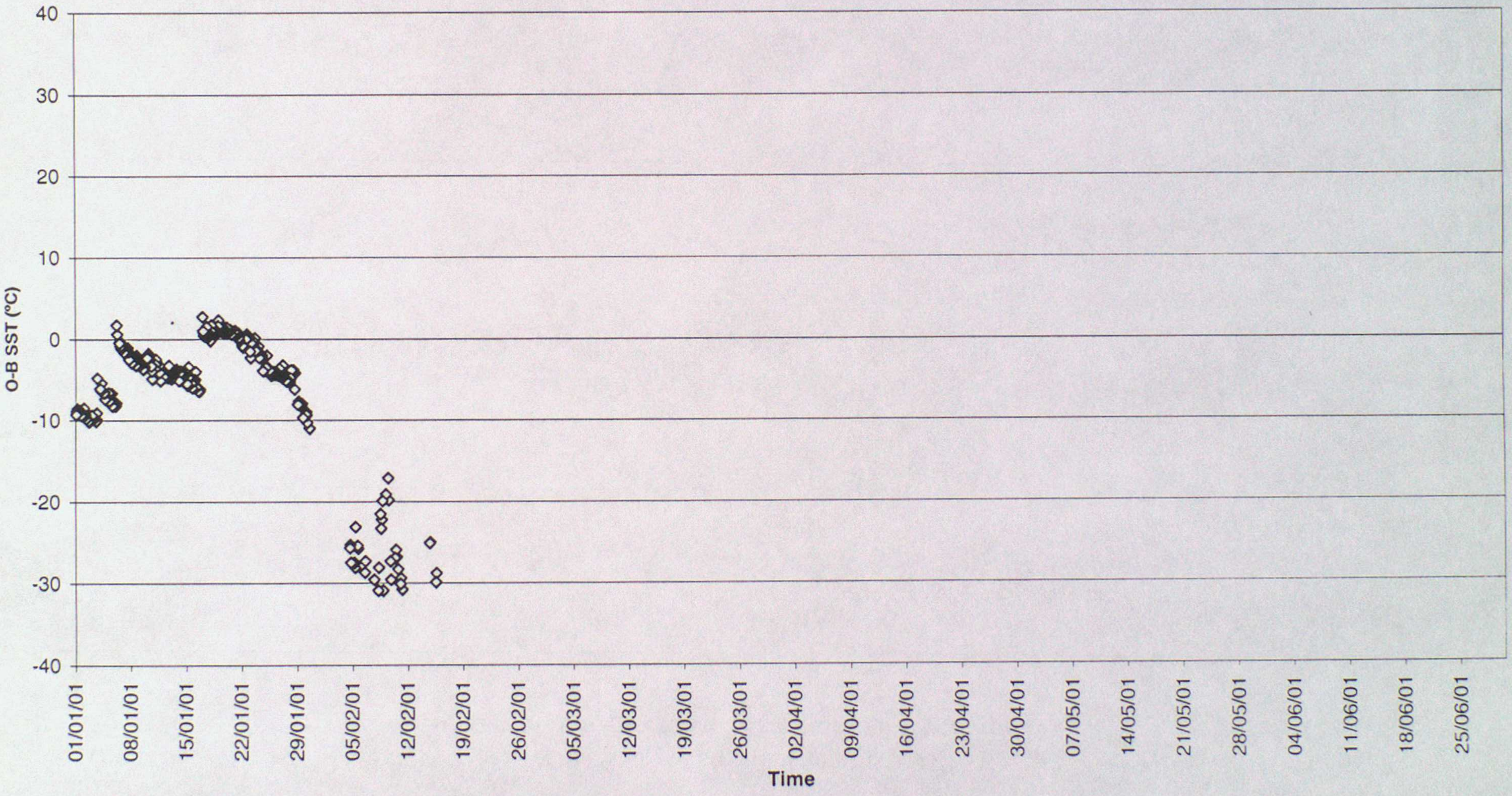




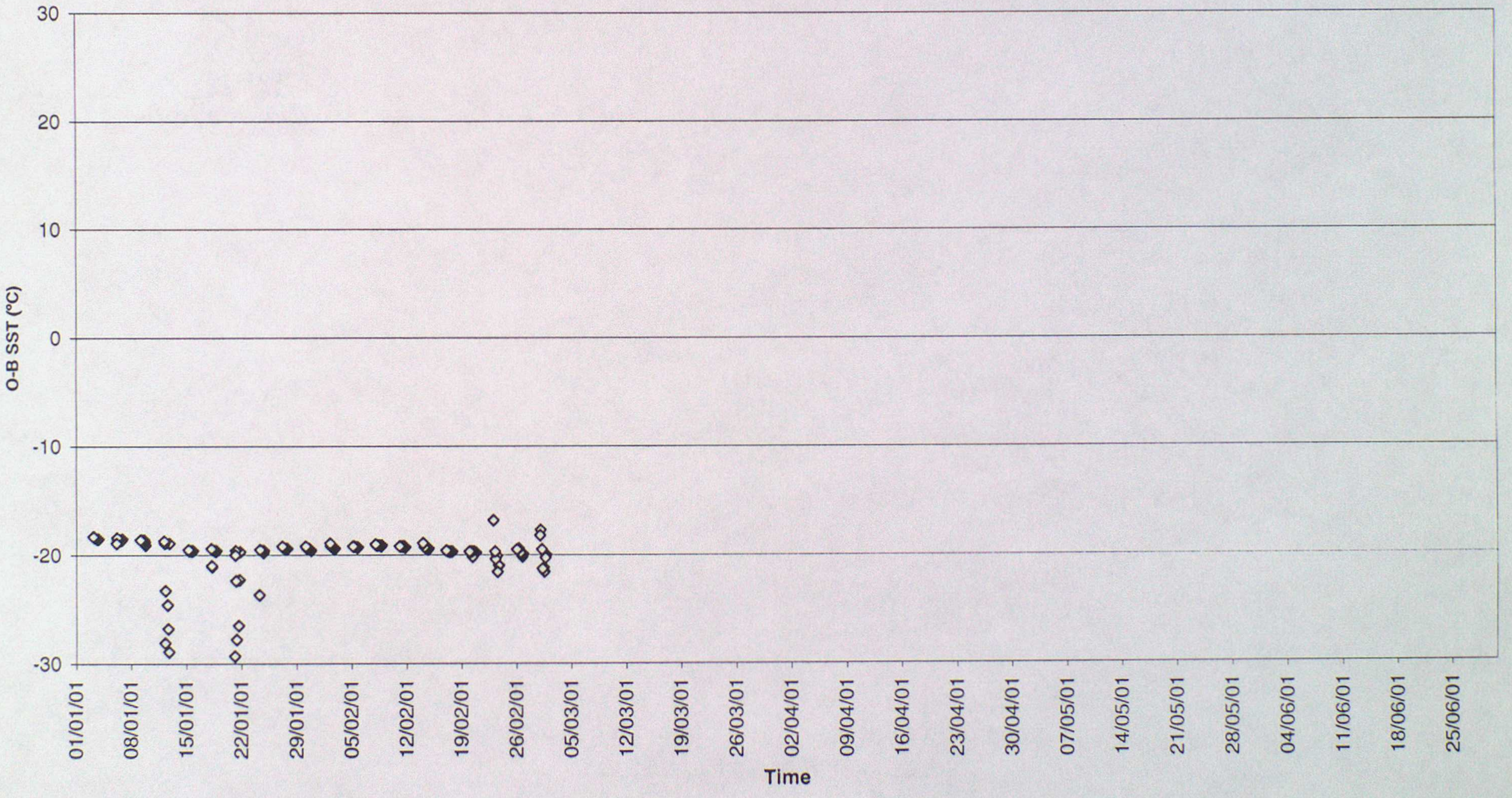
O-B SST (°C) for identifier 51658
Number of obs. plotted = 223    Number of outliers = 0



O-B SST (ºC) for identifier 51805
Number of obs. plotted = 967    Number of outliers = 2

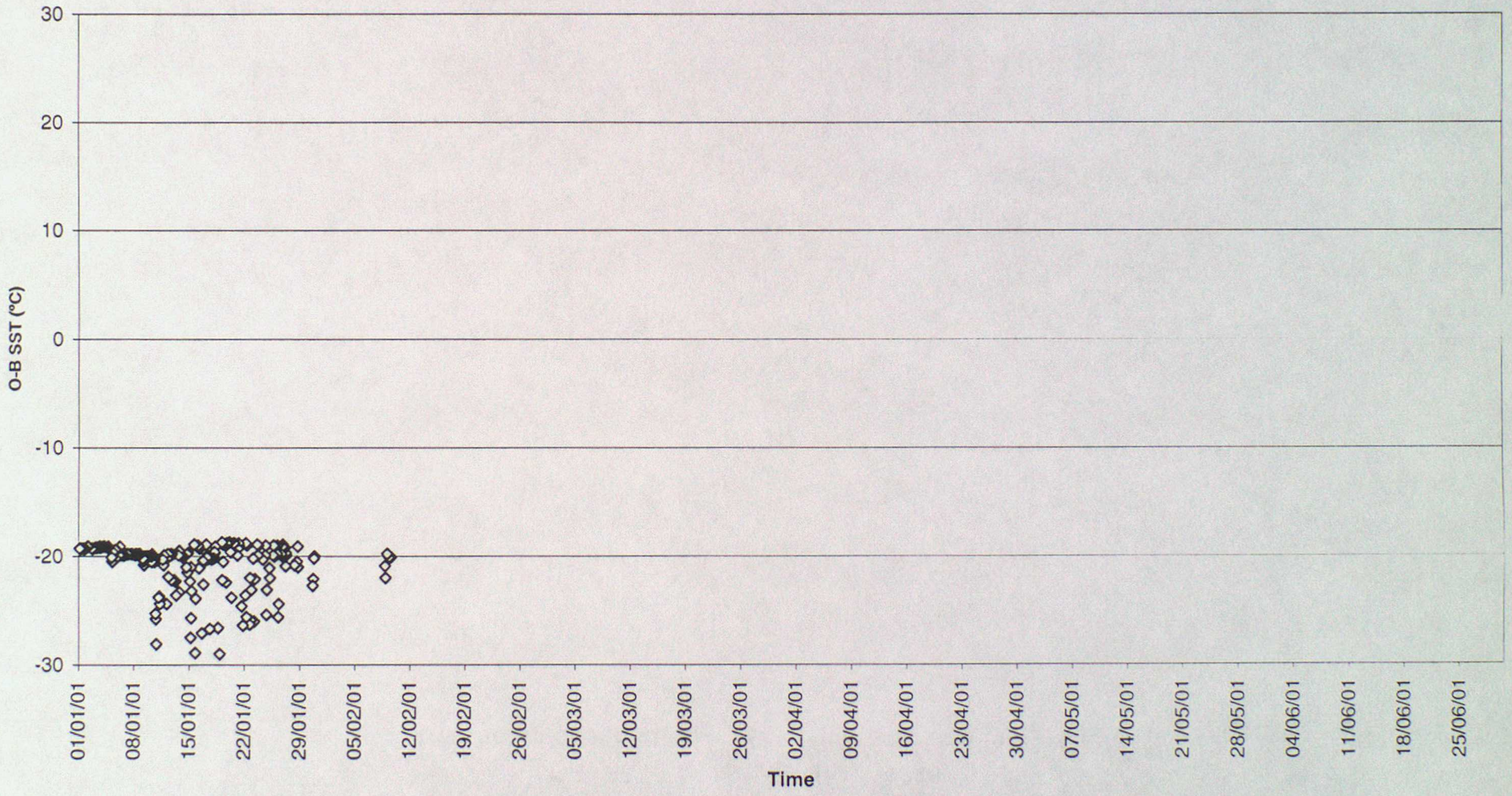

O-B SST (°C) for identifier 51816

Number of obs. plotted = 289    Number of outliers = 0

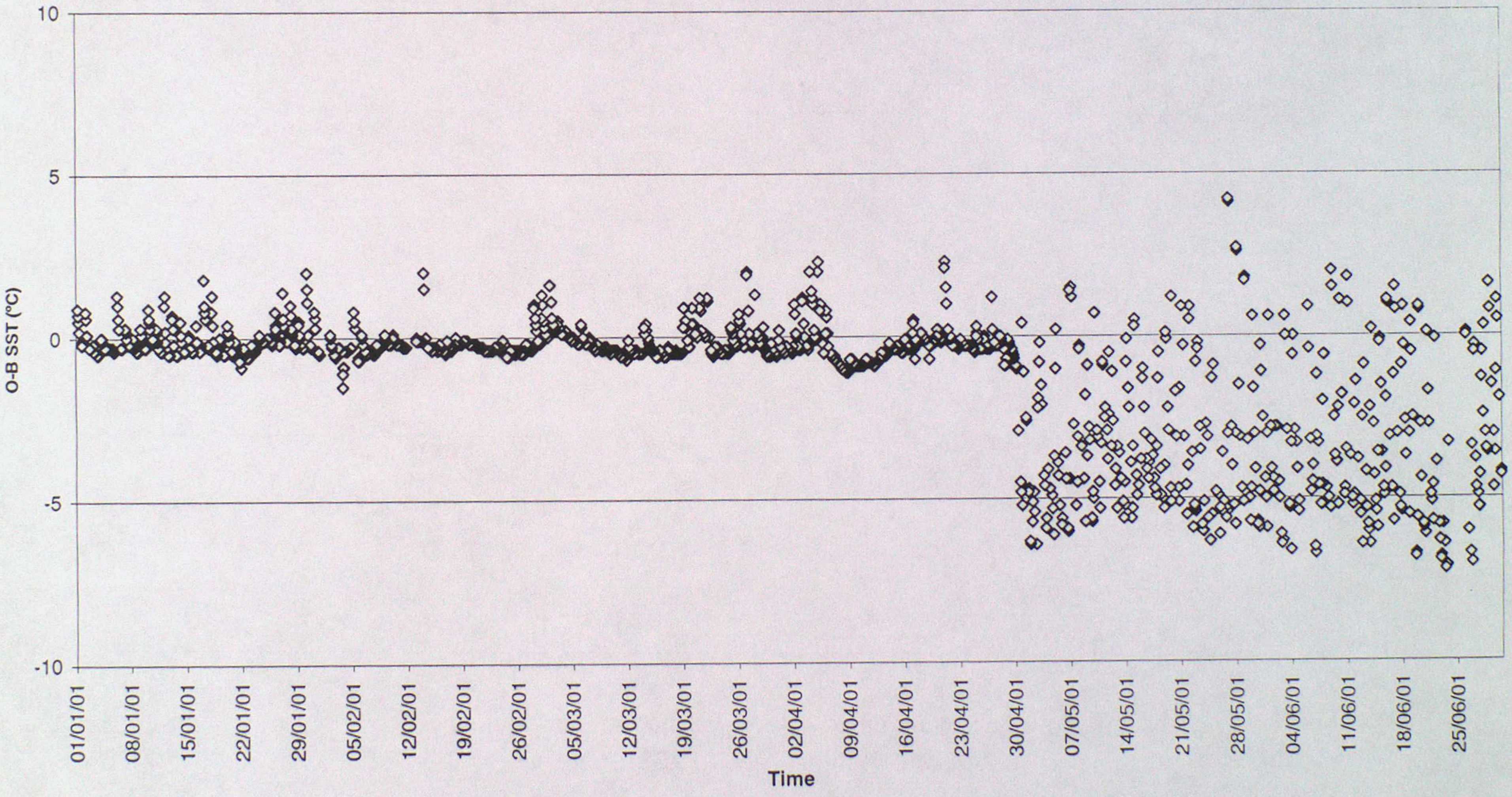


O-B SST (°C) for identifier 51826
Number of obs. plotted = 172 Number of outliers = 0

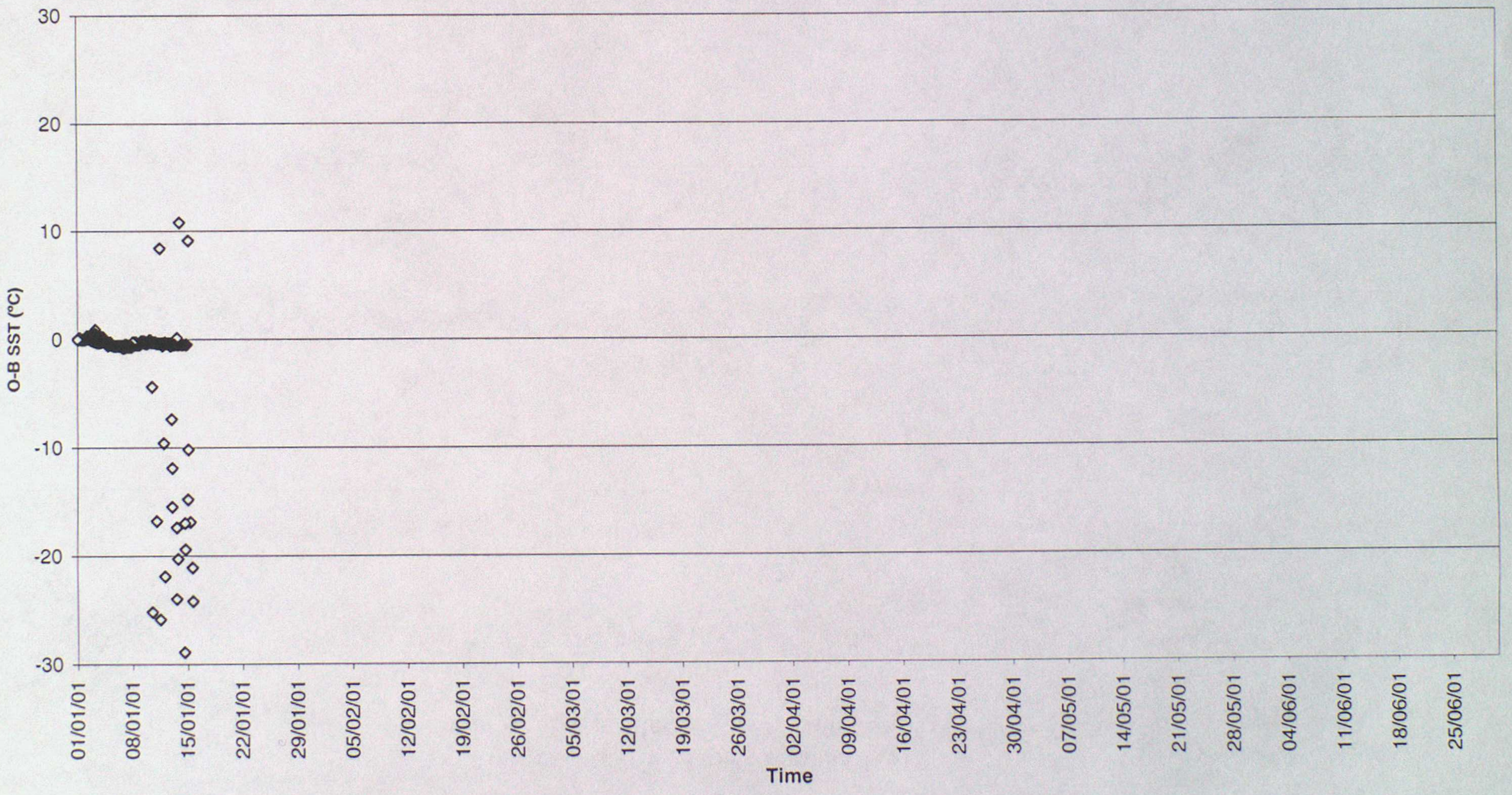
O-B SST (°C) for identifier 52603
Number of obs. plotted = 209    Number of outliers = 0

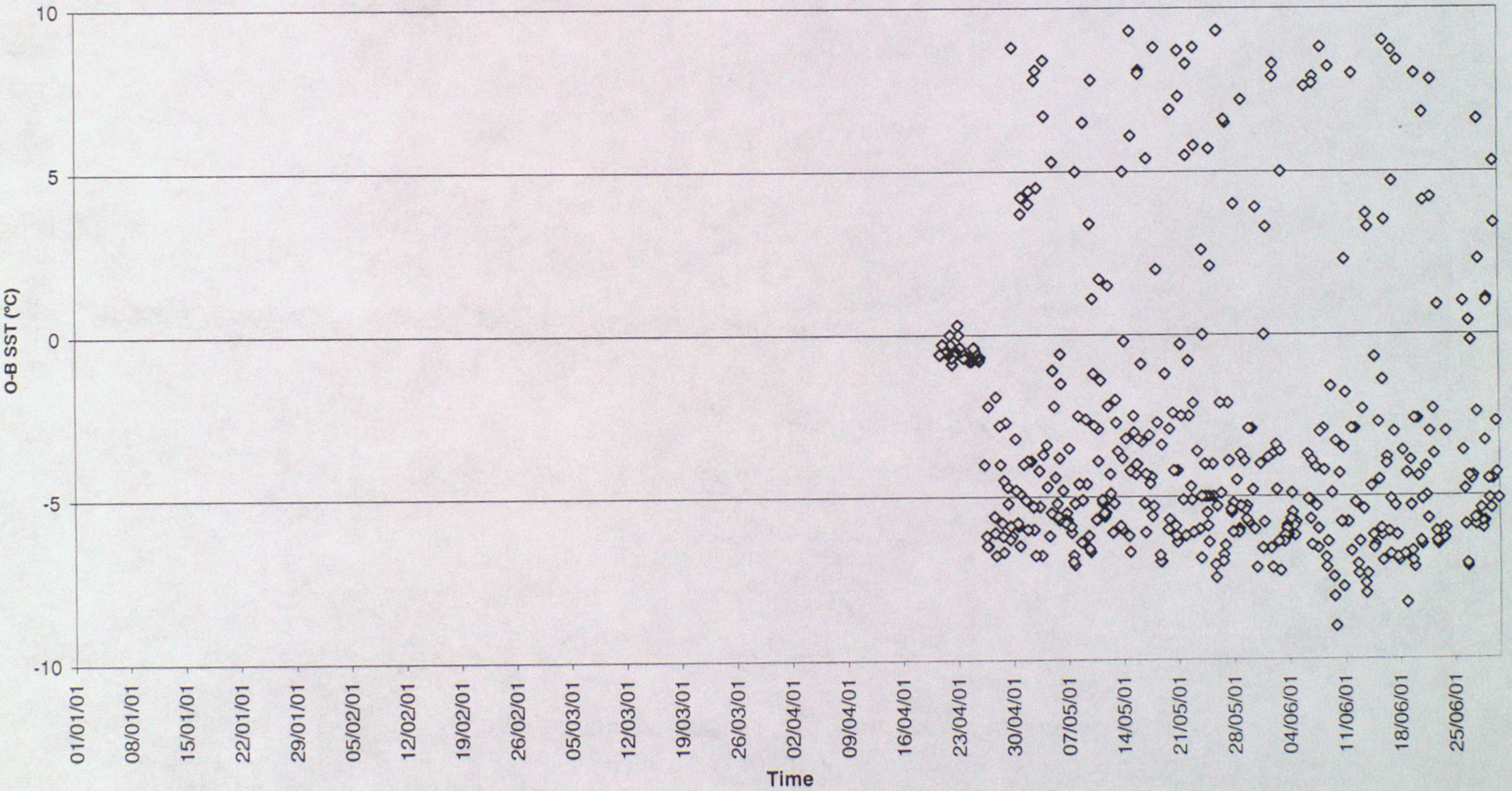


O-B SST (°C) for identifier 52618
Number of obs. plotted = 1366    Number of outliers = 0



O-B SST (°C) for identifier 52652
Number of obs. plotted = 407    Number of outliers = 0

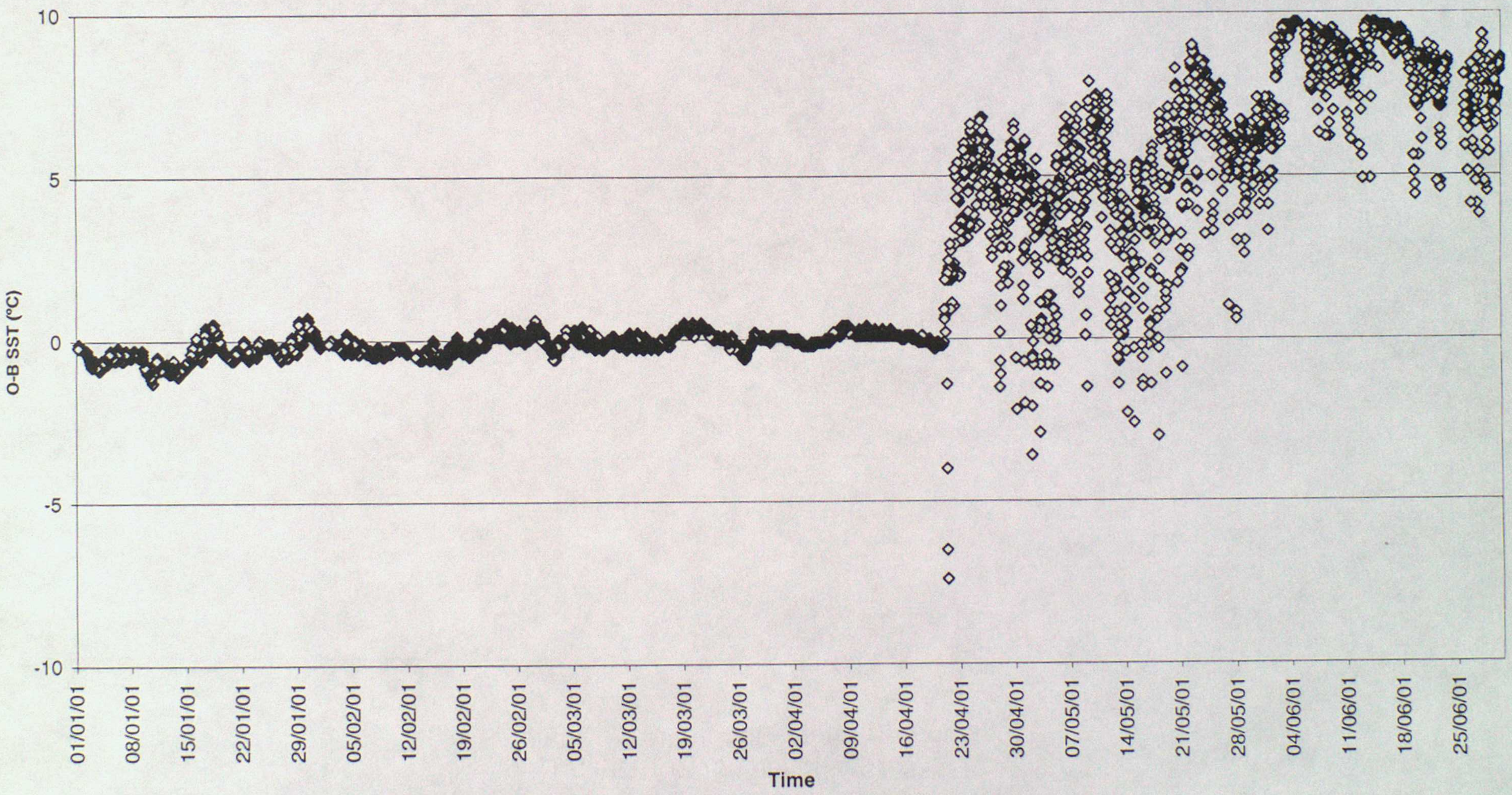


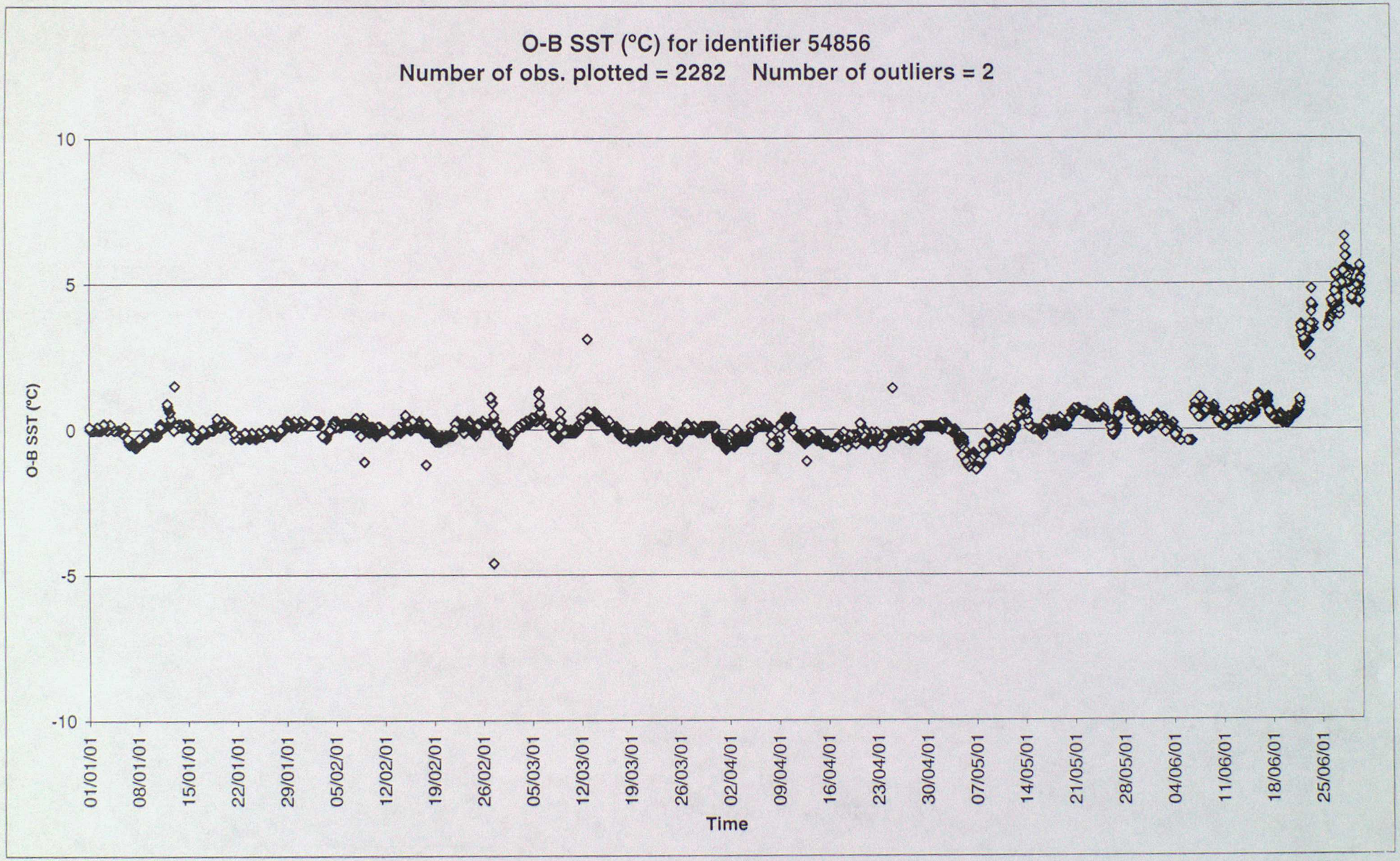


O-B SST (°C) for identifier 52668

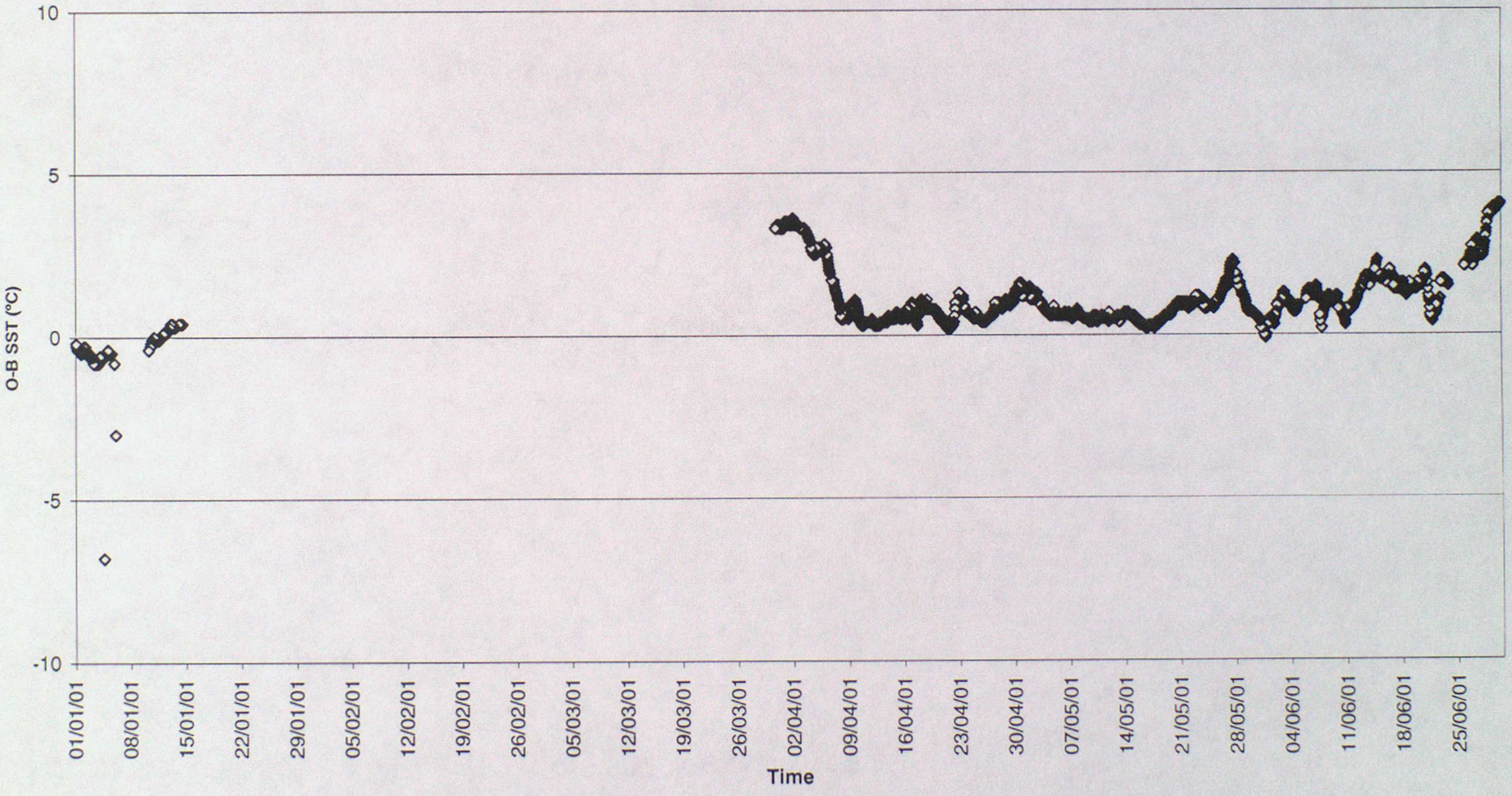
Number of obs. plotted = 448    Number of outliers = 0

O-B SST (°C) for identifier 53517
Number of obs. plotted = 3781    Number of outliers = 0

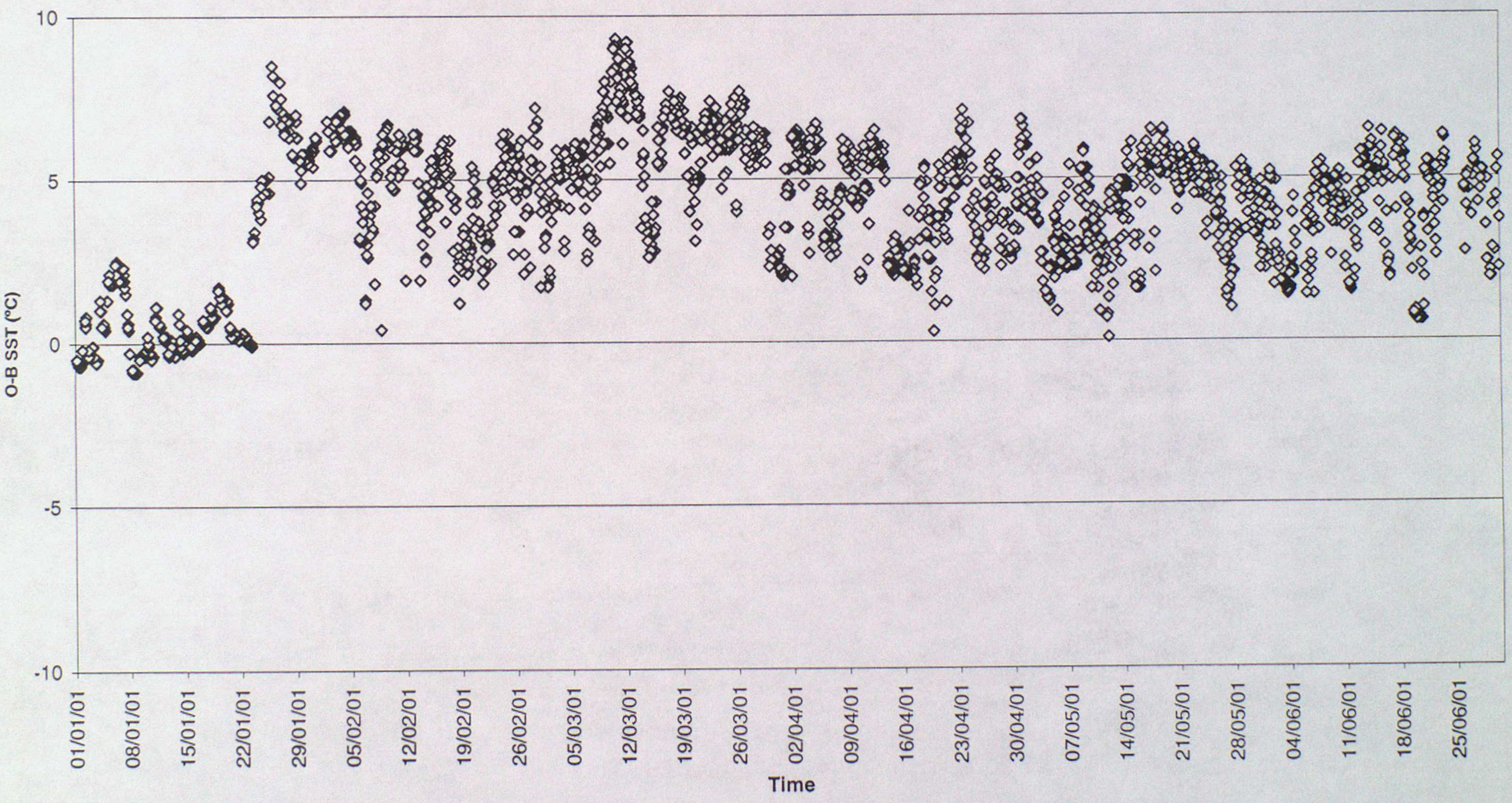




O-B SST (°C) for identifier 54856
Number of obs. plotted = 2282    Number of outliers = 2

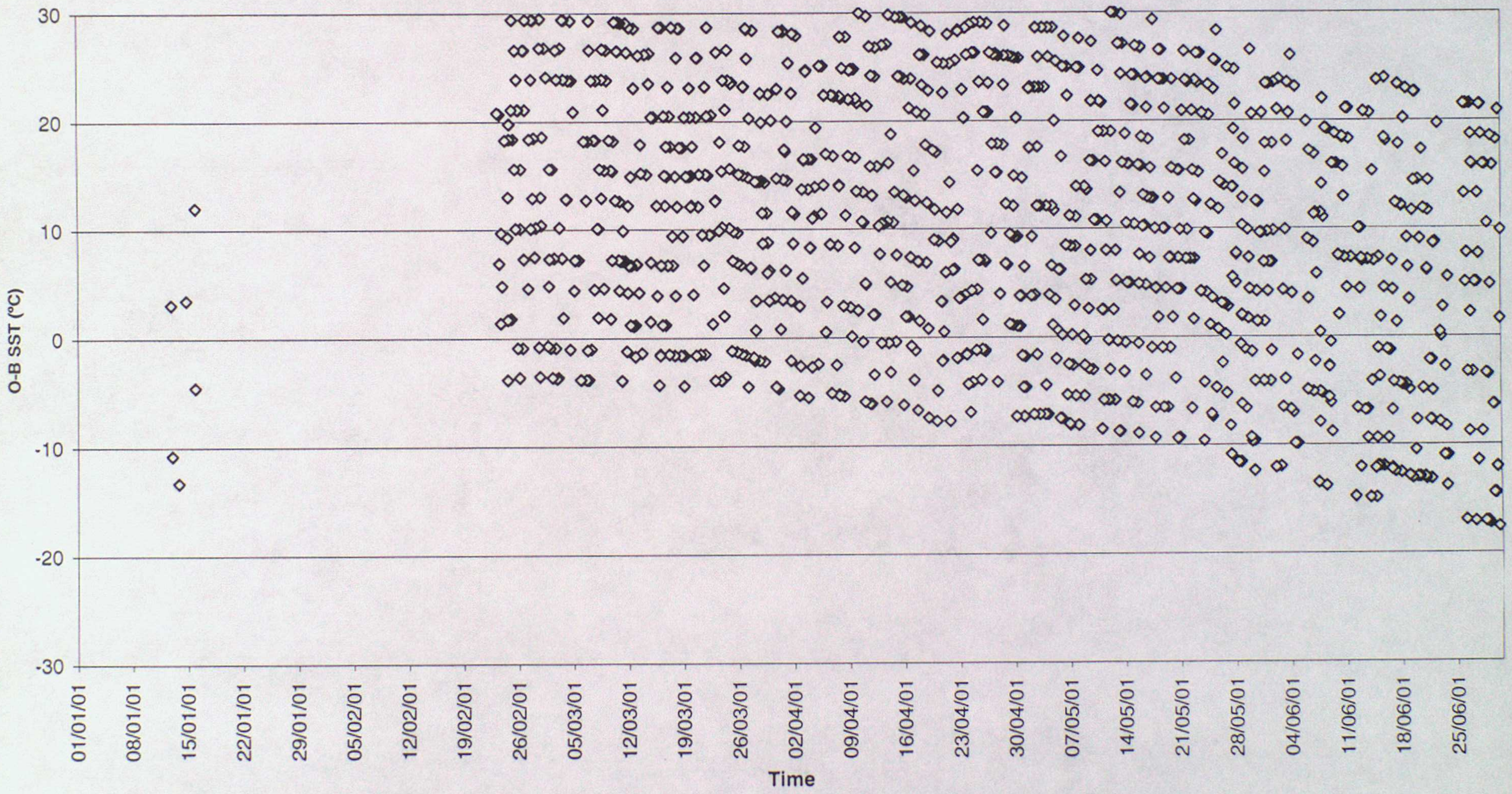


O-B SST (°C) for identifier 55905
Number of obs. plotted = 2184    Number of outliers = 1



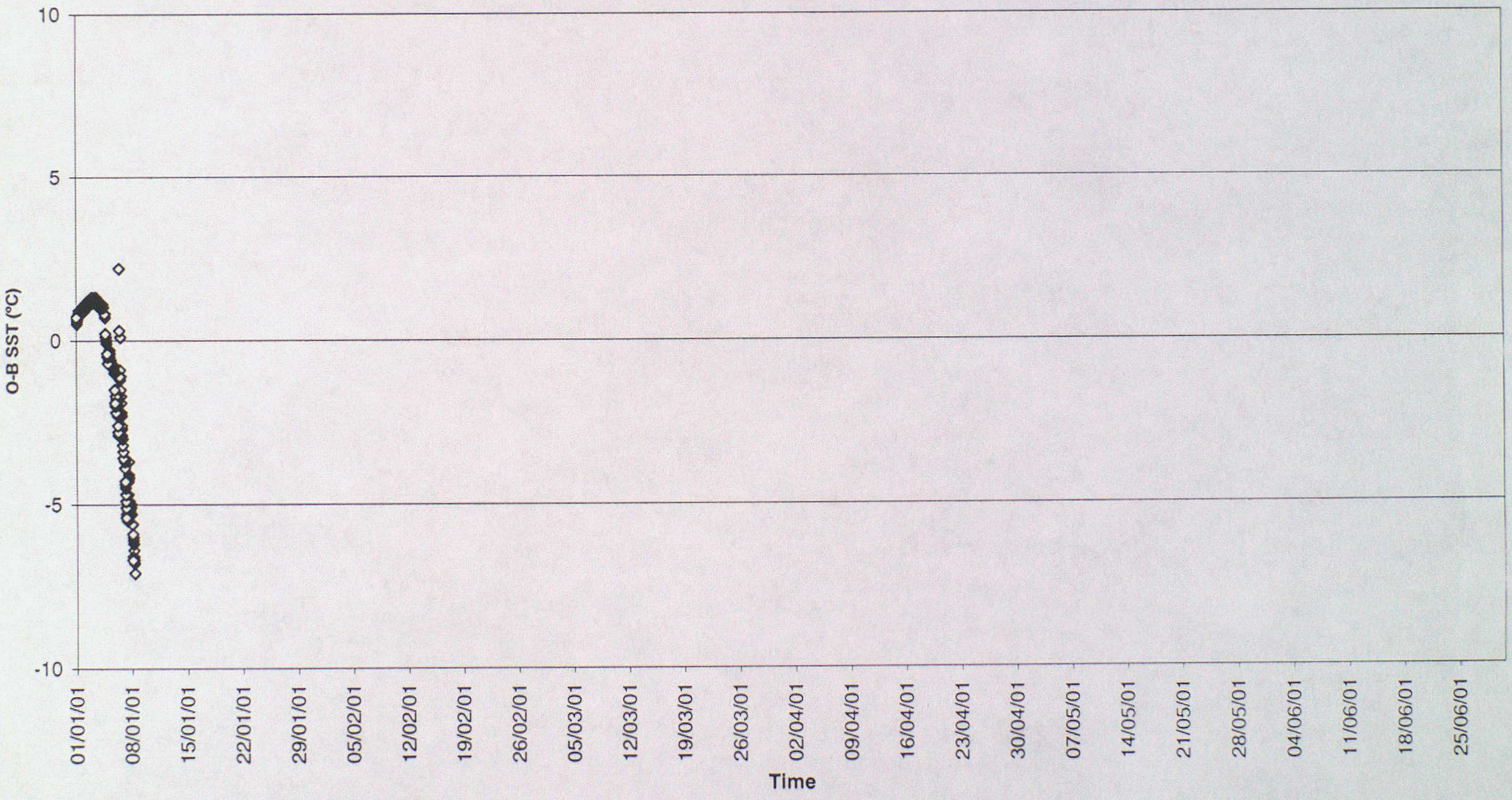
O-B SST (°C) for identifier 55912
Number of obs. plotted = 2074    Number of outliers = 5

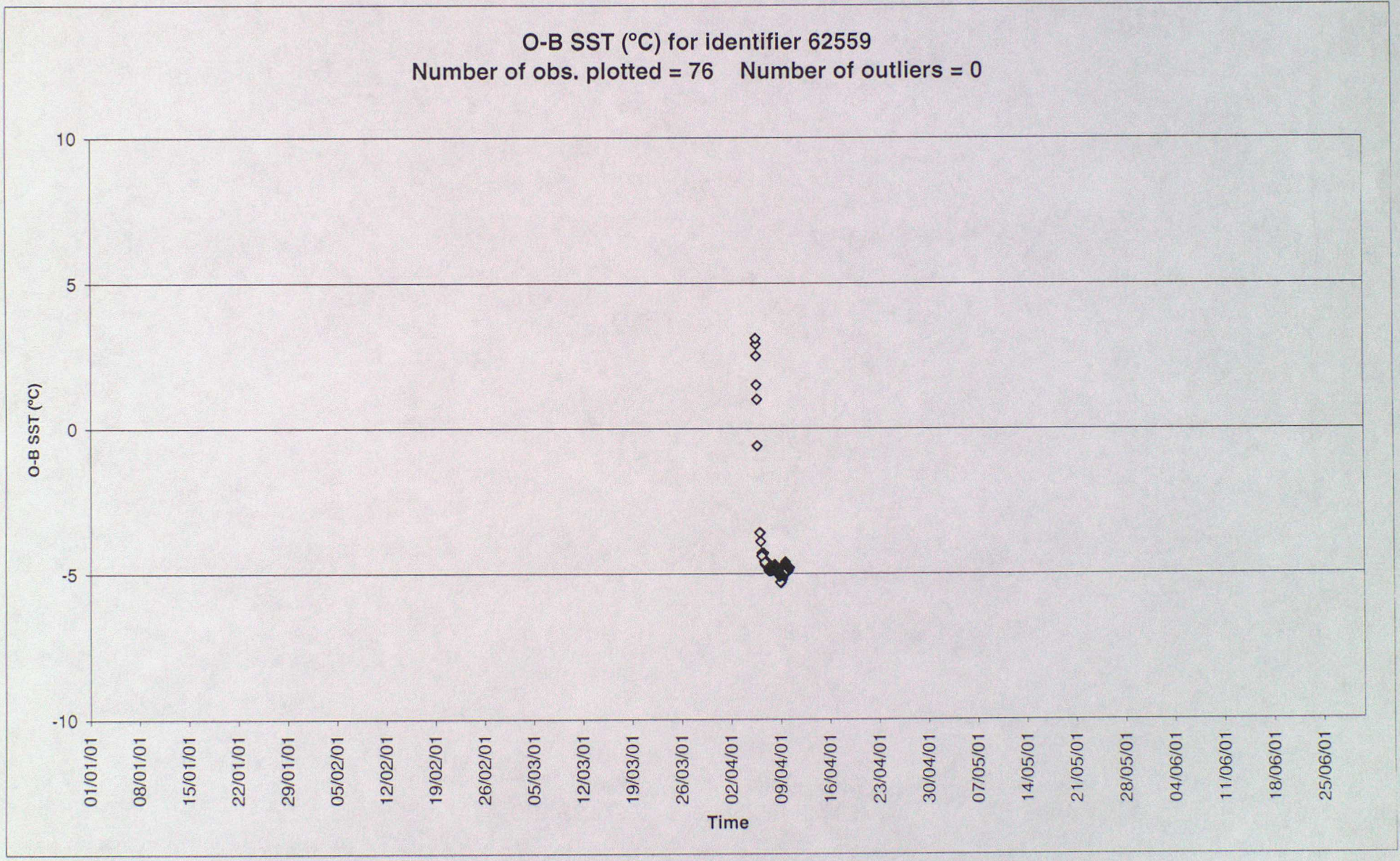
O-B SST (°C) for identifier 61589
Number of obs. plotted = 1333    Number of outliers = 88



O-B SST (°C) for identifier 62509

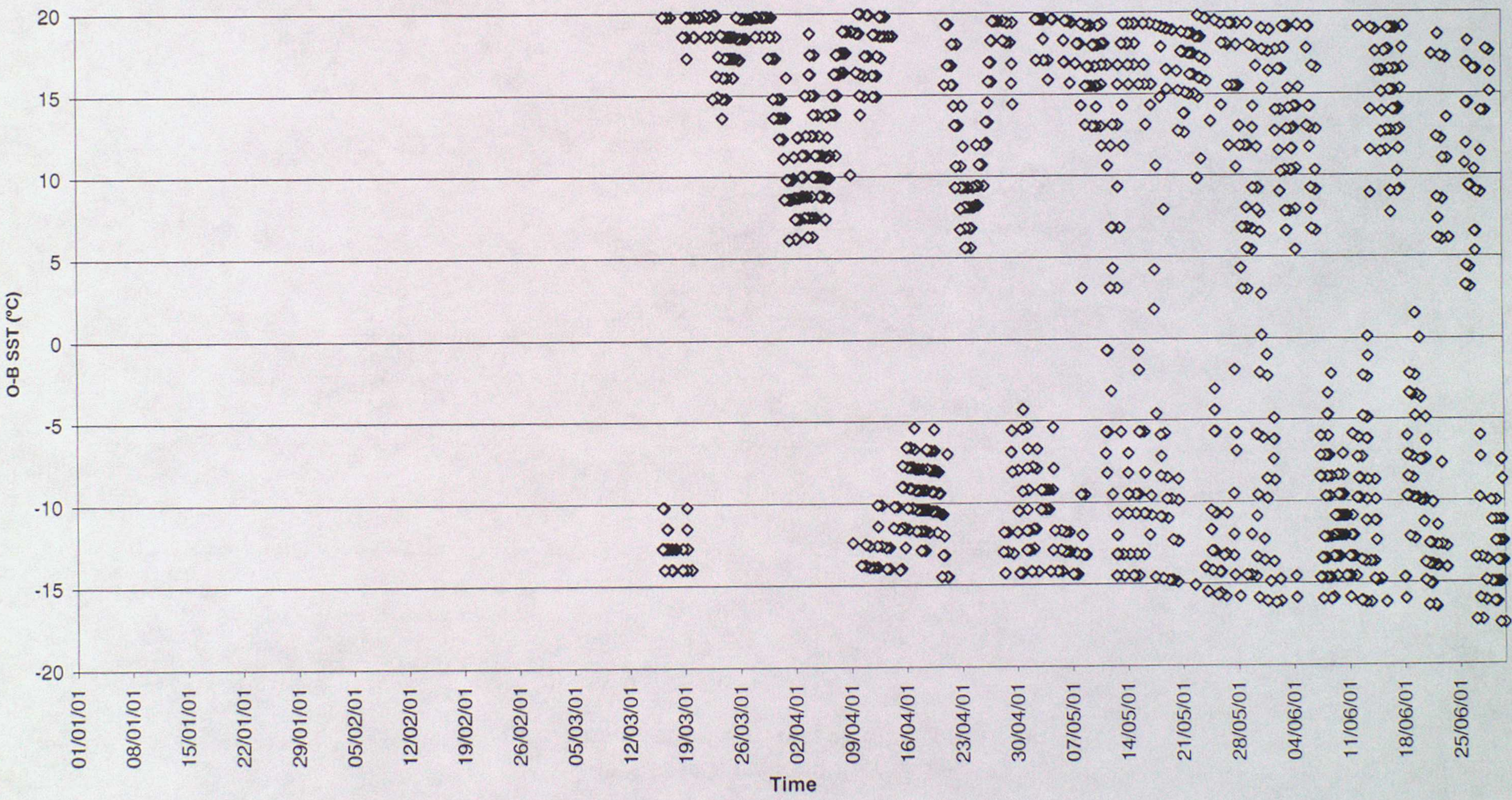
Number of obs. plotted = 296    Number of outliers = 0



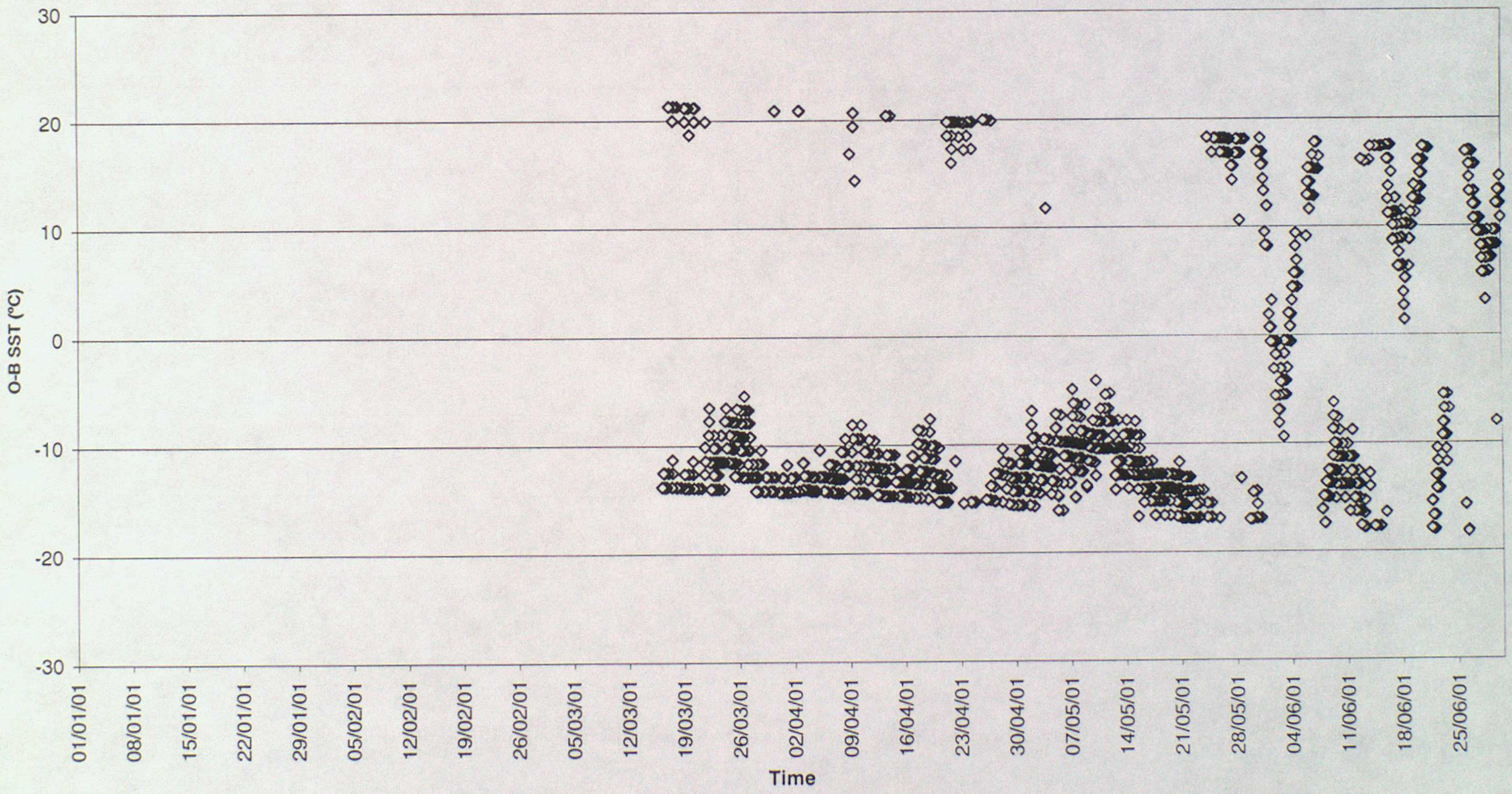


O-B SST (°C) for identifier 62559
Number of obs. plotted = 76    Number of outliers = 0

O-B SST (°C) for identifier 62843
Number of obs. plotted = 1391    Number of outliers = 86



O-B SST (°C) for identifier 62844
Number of obs. plotted = 1344    Number of outliers = 0



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